WHITE PAPER:

Hangar Foam Fire Suppression Systems:

More Harm than Good?

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Introduction

Aircraft hangars are unique structures with configurations and contents that can pose unusual hazards. Often very large with high ceilings, they typically house aircraft that are asymmetrical objects containing flammable or combustible fuel. Aircraft support apparatus such as tugs, maintenance equipment and vehicles, all of which are mobile and can be in different areas in a hangar at any time, contain possible fire ignition sources. All of this can be disconcerting, and surely the concern around potential fires is understood.

But where are the fires? We have spoken to clients and many others in the aviation industry - whether Global Aerospace senior claims personnel or those from the FBO, engineering, aircraft operator or industry advocacy group communities - and not one person can recall a single event where a fuel spill ignited and activated the hangar foam fire suppression system.

The claims data developed by Global Aerospace as a worldwide insurance provider suggests that false activations dominate the activity in this area. In our claims experience, we have yet to observe a fuel spill fire that caused the activation of the hangar foam fire suppression system. We often see inadvertent foam discharges that, among other things, damage property, interrupt businesses and take aircraft out of service. To be fair, industry data gathered during the past 20 years suggests that hangar fires, while quite rare, are not unheard of. However, the origin of these fires is not usually the aircraft fuel and the fires tend to occur in less sophisticated hangar environments.

In our claims experience, we have yet to observe a fuel spill fire that caused the activation of the hangar foam fire suppression system.

It is very difficult to reconcile the fire loss history with the substantial fire code requirements for aircraft hangars. Some individuals in the industry argue that fire codes and standards, which were established in the 1950s before advances in chemical technologies made jet fuel less flammable, haven't kept pace with those and other technological and operational advancements.

Our goal is to raise awareness of issues around automatic fire suppression systems with a focus on the numerous risks associated with inadvertent foam discharges. Even without a fire, property, assets, human life, reputation and brand image – all the things so valuable to businesses – can be exposed to significant and arguably preventable risks.

The circumstances of the following two claims were different but emblematic of issues around false activations of fire suppression systems:

1. Claim #1

It was 2:18 a.m. Security cameras were fully operational and recorded the entire event. No one was in the hangar or on duty at the time. The security cameras suddenly recorded rapidly discharging foam being dispensed throughout the hangar. Within a few minutes, three aircraft were submerged in foam.

Are the codes and standards that call for sophisticated fire suppression systems disconnected with the risks in today's aviation world?

There was no fire anywhere in the hangar. The foam continued to be discharged.

2. Claim #2

It was a quiet summer afternoon in a large private aircraft hangar. Some aircraft were out on trips while two remained in the hangar. A contractor and line maintenance employee were assessing a lavatory issue and were on board one of the aircraft. Sirens started to sound but there was initial confusion as to what was happening. The contractor and employee were finishing their conversation when suddenly foam began discharging from the ceiling. Foam was also being discharged from the side hangar walls directly onto the floor beneath the aircraft wings.

At that point, the contractor and employee had very little time to safely evacuate the hangar. They quickly were overwhelmed by the volume of foam rising from the floor and raining down from above and decided to retreat into the aircraft. The aircraft door remained open and the foam began to fill the interior. The men in the aircraft were quickly running out of options.

Fortunately, another employee in the hangar realized there was no fire and invoked the manual shut off valve to terminate the foam release. It was a terrifying experience for those involved.

What is happening?

While no injuries resulted from the two aforementioned events involving our clients, there was a fatal event in January 2014 at Eglin Air Force base. There, a civilian contractor was killed after being trapped in a hangar filled with foam after an inadvertent fire suppression system discharge. It should be noted that this person reportedly reentered the building after the foam system had discharged and after he had safely evacuated.

These events illustrate a troubling phenomenon that has been occurring for a number of years – inadvertent discharges of foam fire suppression systems that pose significant risks to life and property.

This raises a few central questions we intend to explore in this white paper. Are the codes and standards that call for sophisticated fire suppression systems disconnected to the risks in today's aviation world? Have the codes been adapted to account for technological progress in aviation equipment, fuels and operations? Is compliance too costly and burdensome in relation to the actual fire risks?

The NFPA (National Fire Protection Association)

From the NFPA website: "The National Fire Protection Association is a global self-funded nonprofit organization, established in 1896, devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards." NFPA develops the fire protection codes and standards that are designed to "minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation around the world. NFPA is active in public education, outreach/advocacy, training and research."

The NFPA has no rule-making authority per se, but the organization is well respected by the aviation industry. Standards that are promulgated by NFPA are considered

industry standards. NFPA gains its influence in a variety of ways. One is through the International Building Code (IBC) followed by nearly every state in the USA. The IBC references nationally developed consensus standards that are often adopted in accordance with the laws and procedures of a particular jurisdiction.

NFPA 409 - Standard on Aircraft Hangars is the "standard that helps safeguard life and property through the requirements for the proper construction and fire protection of aircraft hangars used for aircraft storage, maintenance, or related activities." NFPA 409 is the standard that calls for automatic fire suppression systems in many types of hangars. NFPA 409 protection requirements are referenced by the IBC and many municipalities and airports have adopted NFPA requirements.

Hangar structures are usually located on airports and it is important to note many airports mandate adherence to NFPA 409 for hangar construction. The aviation industry in general views NFPA 409 as a requirement for doing business. However, many argue the requirement for foam is too burdensome in certain circumstances. In the quest to "safeguard life and property," has NFPA 409, however well-intentioned, gone too far with hangar foam requirements and not kept pace with changes in the aviation industry?

One of the overarching fears in a hangar environment is a large fuel spill with the potential to ignite along the floor.

Hangar Requirements

Construction

NFPA 409 requirements generally call for the use of noncombustible or limited-combustible construction material. Other construction requirements to mitigate fire risk involve protection of structural columns, draft curtains, internal fire rated separations, flame resistance membrane structure material, egress and drainage.

Classifications

NFPA 409 classifies hangars by size:

Group I Aircraft Hangars – access door greater than 28 feet in height or a single fire area in excess of 40,000 square feet. Think of these as large hangars that can accommodate airline-style aircraft.

Group II Aircraft Hangars – access door not greater than 28 feet in height and a single fire area below 40,000 square feet. The square footage tiers downward based on the type of hangar construction. Most general aviation business jets can be accommodated in a Group II-sized hangar. As a point of reference, Gulfstream G500 and G600 business jets are around 25 feet in height.

Group III Aircraft Hangars – very similar to Group II except for generally smaller fire areas depending upon hangar construction. These are smaller hangars that are commonly found in the general aviation – T-hangars, box hangars and shade hangars are examples.

Group IV Aircraft Hangars – any structure constructed of a membrane-covered rigid-steel frame. This type of hangar can vary greatly in size from one to another.

NFPA 409 requirements call for automatic fire suppression **without** the need for human intervention. The systems in use today possess a means of fire detection, system actuation and delivery of an extinguishing agent (usually foam).

The advantages of foam are based on its chemical composition and how it binds to standing fuel on a hangar floor – it acts as a smothering mechanism.

NFPA 409 requirements have evolved over the past 70 years. The initial intent originates from a time when the hangar was more costly than the aircraft it housed. Currently, NFPA 409 requirements are generally intended to protect the structure (hangar) and not the contents (aircraft). One of the overarching fears in a hangar environment is a large fuel spill with the potential to ignite along the floor. Consequently, over the years the NFPA 409 code has been revised to include the greater use of foam to blanket the entire hangar floor. Foam fire suppression systems are designed to deal with a fuel spill or leak under an aircraft and ideally prevent or put out a fire before it extends to the aircraft.

The types of fire protection systems for aircraft hangars are one of the following (based on hangar group):

- Foam-water deluge system (all sprinklers operate simultaneously);
- Automatic sprinkler protection (sprinklers can operate independent or in certain groups);
- Automatic sprinkler protection with automatic low-level, low-expansion foam system;
- Automatic sprinkler protection with automatic low-level, high-expansion foam system;
- Automatic sprinkler protection with foam mixed into the piping.

Many technical requirements apply to foam-water deluge systems including maximum floor area underneath a protection system (no more than 15,000 square feet), specified maximum distances between sprinklers, discharge density rates and various mathematical calculations around water supply and foam concentrate.

The advantages of foam are based on its chemical composition and how it binds to standing fuel on a hangar floor – it acts as a smothering mechanism. Foam can better extinguish high-challenge fires, uses less water, and reduces flammable liquid runoff.

The main disadvantages are system cost, the need to ensure proper foam runoff disposal and the risk of environmental damage if foam escapes its containment system and seeps into ground or surface water.

There are two primary types of foam systems used for hangars. One is high-expansion foam (HEF). While effective, HEF poses the greatest risk to life safety as it is difficult to breathe and can be disorienting when engulfed in it. During foam deployment, fans or blowers add air to the foam which makes bubbles. While the system is designed to provide foam to several feet in height, during discharge the foam can reach heights of 8 to 10 feet.

The second type of foam is aqueous film-forming foam (AFFF), which creates a film that smothers fire and does not reach nearly the height of HEF. AFFF is frequently used for meeting the NFPA low-expansion foam requirement.

Automatic fire suppression requirements for NFPA hangar classifications

NFPA 409 sets forth fire suppression requirements in accordance with the previously mentioned hangar classifications:

Protection for Group I Hangars:

- Deluge foam-water sprinkler system plus supplementary protection through low-

expansion or high-expansion foam systems to protect the area beneath aircraft; or

- Automatic sprinkler protection (not deluge foam-water) and automatic low-level, low-expansion foam system to cover/protect entire floor; or
- Automatic sprinkler protection (not deluge foam-water) and automatic low-level, high-expansion foam (HEF) system to cover/protect entire floor.

Protection for Group II Hangars:

- Deluge foam-water sprinkler system with a slight deviation from the Group I requirement to take into account an air-aspirated discharging system; or
- Automatic sprinkler protection (not deluge foam-water) and automatic low-level, low-expansion foam system to cover/protect entire floor; or
- Automatic sprinkler protection (not deluge foam-water) and automatic low-level, high-expansion foam (HEF) system to cover/protect entire floor; or
- Automatic foam-water sprinkler protection.

Protection for Group III Hangars:

- In accordance with locally adopted building codes. The practical effect of this requirement, generally speaking, is a water sprinkler requirement only for hangars larger than 12,000 square feet in accordance with IBC standards;
- Where hazardous operations take place – fuel transfer, welding, torch soldering, spray painting - requirements for Group II apply;
- Distribution of portable fire extinguishers in aircraft storage and servicing areas.

Protection for Group IV Hangars:

- Automatic low-level, low-expansion foam system; or
- Automatic low-level, high-expansion foam system; or
- A closed-head sprinkler (not foam) system for Group IV unfueled aircraft storage.

The costs associated with conforming to the fire suppression requirements set forth above are substantial. Some estimates suggest the cost to equip a Group I or II hangar with an acceptable fire suppression system can be 30 or 40 percent of the cost of the hangar itself. Some of the systems can exceed $1,000,000 in total costs.

Depending on where the hangar is located, it might be necessary to store thousands of gallons of water if the hangar is not connected to a municipal water system. Fire pumps are an important part of the fire suppression system infrastructure and, depending on the size of the hangar, multiple fires pumps might be needed to ensure the correct water pressures flowing throughout the system. Costs can spike if foam runoff needs to be captured (usually it does).

Does the loss data support NFPA 409 requirements?

Some in the industry argue we are over-engineering against a non-existent threat and there is a life safety issue associated with foam fire suppression systems. A growing chorus of industry players say the return on investment around fire suppression systems is a negative one.

“My goal is to eliminate foam fire suppression in Group II hangars,” says Mercer

Some in the industry argue we are over-engineering against a non-existent threat and there is a life safety issue associated with foam fire suppression systems.

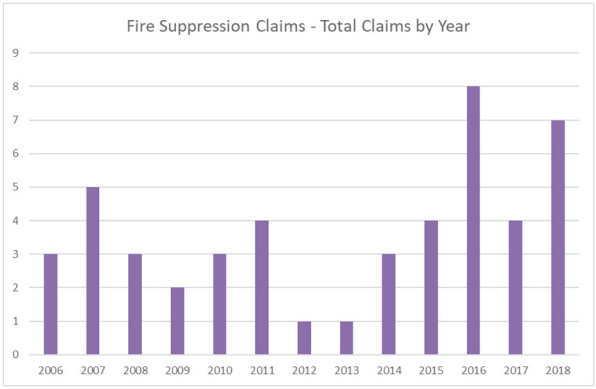
...there are numerous reports of false activations of fire suppression systems and a growing sentiment it is happening too frequently.

Dye, founder of Dye Aviation Facility Architecture, LLC. Mr. Dye has been advocating changes to NFPA for at least a decade and serves as a backup member to the NFPA 409 Technical Committee. One of Mr. Dye's central arguments is NFPA 409 is not scaled to the relative risk of the general aviation industry. Another key point he makes is there are few if any known events where a fuel spill ignited thereby activating the foam system. Instead, there are numerous reports of false activations of fire suppression systems and a growing sentiment that it is happening too frequently.

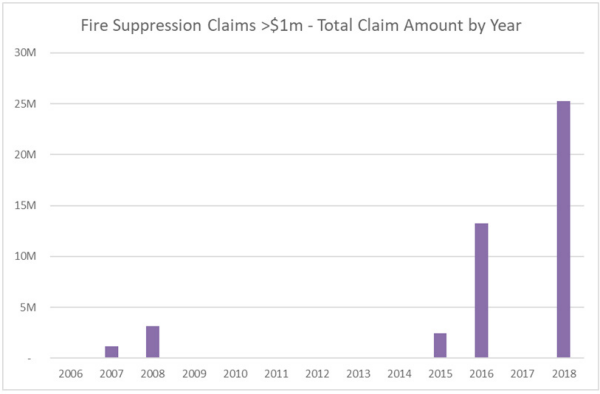
At Global Aerospace, we decided to look at our own claims data over the past 12 years to test the hypothesis that fire suppression systems were triggered by false activations instead of actual fuel spill fires. Our study was conducted in December 2018.

We discovered 51 claims around the world where the claims description involved "uncommanded activation," "unintentional dispersion of foam", "erroneous operation of fire suppression system" and "inadvertent discharge." We found no examples of an intentional discharge in response to a fire. The mean value of the resulting claims exceeds $1 million, as is illustrated in the following:

Fire Suppression Claims - Summary of Claims from Around the World



- **We see an average of just under 4 claims of this type annually**
- **There has been a slight increase in frequency since 2013**



- **There have been 5 claims greater than $1 million in the last 4 years, totaling $41 million. There were only 2 claims greater than $1 million in the 9 years prior to that.**
- **Largest claim was in 2018, claim amount was $25 million.**

*Source: In-House Global Aerospace Data. All claim amounts are grossed up to 100% to account for varying levels of insurer participation.

Keep in mind this data involves only Global Aerospace risks. While we are certainly one of the larger providers in the worldwide aviation insurance space, we do have insurance company peers who have their own market share so the data presented above represents a partial picture of the overall market position.

We have been in discussions with various industry stakeholders on this topic, one of which is insurance broker Willis Towers Watson Aerospace group. Michael Petersen, a claims attorney for Willis Tower Watson, has recently studied the issue of inadvertent foam fire suppression events for his firm and clients.

Mr. Petersen commented, "In just 18 months, the Willis Towers Watson Aerospace group has seen seven clients suffer losses from inadvertent foam fire discharges. As a result, we have been studying this issue and trying to promote greater awareness of the problems with foam systems and develop strategies for our clients to reduce and mitigate the risks. In turn, this has led to our working closely with the National Air Transportation Association who is spearheading efforts to change NFPA 409."

Global Aerospace has started taking a closer look at the ramifications of false activations as well. In the pages that follow, we will illustrate the non-human costs and address the human aspects as well.

There are far-reaching ramifications associated with the inadvertent discharge of fire suppression foam. Among them are:

- Damage to aircraft – this involves direct physical damage and costs to restore the aircraft to its original condition;
- Consequential damages – lost business opportunities, missed flights, substitute lift costs, relocation to temporary space, employee time and distractions that detract from core mission;
- Reputation and brand damage;
- Cost to restore fire suppression system – $50,000 or more for certain systems;
- Environmental damage – We have handled claims involving faulty containment systems that allowed for the escape of foam remnants and residue from the hangar complex which have resulted in significant environmental contamination affecting local communities. This is especially true with older AFFF foams, which can be carcinogenic. Newer foams are less toxic thanks to improved chemical composition with certain protein-based foams now being biodegradable.

From an aviation claims perspective, the most common aircraft damages we see in the aftermath of a foam discharge event relate to brake assemblies, avionics and engines. When all these components are affected, repairs can easily exceed $1 million.

We have observed a great deal of variation in OEM protocols pertaining to repair scopes for aircraft subjected to a foam event. From a rinse down to a tear down, required repairs cover the spectrum and the costs can be substantial.

One of our biggest concerns at Global Aerospace is the life safety issue presented by a false activation foam event. Fortunately, our data is devoid of any bodily injury or death claims. In addition to the previously described Air Force high-expansion foam mishap, the industry has experienced some close calls with respect to life safety and some have affected our clients.

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"It can be an extremely dangerous situation," says Lance Toland, founder of Lance Toland Aviation Insurance Managers, when describing the scene in a hangar that is experiencing a foam discharge event. Mr. Toland has firsthand experience in foam discharge events, having assisted multiple clients through the ordeal.

Mr. Toland describes a scene in which a human chain was established within a hangar during an inadvertent foam deployment that nearly cost a life. The foam system discharged while aircraft maintenance personnel and cleaners were in the hangar. The hangar doors automatically shut when the system activated and an aircraft cleaner tried to exit the hangar but was stuck on the floor trapped within the rising foam. Nearly eight feet of foam had accumulated and a human chain was needed to rescue the panic-stricken worker.

People underestimate the life-threatening situation posed by a foam event. Think about a crowded hangar full of aircraft, supporting equipment and personnel. The fire suppression system discharges foam at a rapid rate. With HEF, as called for in NFPA 409, the foam accumulates in just minutes. Those who are caught on the hangar floor face very serious challenges.

The foam itself is chief among them - it is a life-threatening substance. You cannot breathe through it, you cannot see through it and you cannot hear through it . All of those things are especially dangerous for those caught out in the hangar during a discharge event, and just as importantly, it impedes the ability of first responders to assist victims.

Not only is the foam itself life threatening, but also the hangar environment can be very hazardous when trying to escape it with essentially zero visibility.

The Air Force wrote a report about the Eglin Air Force HEF discharge event. Some of the feedback from victims and first responders was that they were "stunned when the foam became a life-threatening and panic-inducing substance." Trained first responders used adjectives such as "white out" and "frightening" to describe the scene that day.

Not only is the foam itself life threatening, but also the hangar environment can be very hazardous when trying to escape it with essentially zero visibility. Things such as ground support equipment parked in unpredictable places, static wicks, flaps and wings can pose serious bodily injury risks to victims of a foam event.

Similarly, Mr. Dye has his own life safety concerns as well:

"Additionally, I believe that fixed foam systems create major life safety concerns for occupants and first responders. The combination of high decibel alarms and flashing lights in conjunction with foam while trying to clear a building and rescue survivors is anyone's nightmare. HEF releases obscure vision and obstruct FLIR type infrared, human imaging equipment. Foam is slippery, increasing the risk of falling and becoming unconscious. In a HEF event this can be deadly as you cannot breathe foam and the first responder is hampered from seeing or hearing the fallen victim. In general aviation hangars, aircraft wings and their static wicks are often at eye or head level. A collision with either could cause serious injury and possible death."

Would you or your team have the presence of mind to successfully escape a foam discharge event that is completely unanticipated? Will the initial reaction be one of startle and therefore cut into your time to safely evacuate?

At Global Aerospace we can help fix airplanes and other property. We can cover loss

of use expenses, too. However, we cannot, of course, undo injuries or fatalities. Life safety issues arising from inadvertent foam discharge events are real and we join in the effort to raise industry awareness around the issue.

Many industry observers lament that NFPA 409 has not kept pace with the modernization of aviation. For example, aircraft construction and manufacturing techniques have improved to the point where aircraft fuel leaks are a rare event. Mr. Toland says "You could throw a match in today's Jet A fuel and it won't ignite," referring to advancements in fuel technologies that have raised the flashpoint of Jet A fuel. Some also suggest the sophistication level of certain operations, particularly in Group I or Group II hangar environments, make automatic fire suppression questionable. Many experts believe that fire suppression system activation should be a manual process in sophisticated environments, which would allow for human confirmation of a fire instead of relying on sensors that might prove to be faulty or erroneous.

"You could throw a match in today's Jet A fuel and it won't ignite."

Why are there seemingly so many inadvertent foam discharge events?

One FBO manager with whom we spoke stated, "Advancements in fire suppression technology are actually causing more headaches. The systems are extraordinarily sensitive to a fault and we have had our share of issues including inadvertent foam discharges."

Industry observers say the most common reason for false activations is improper design, lack of proper commissioning, improper maintenance and failure to follow proper testing procedures. Based on insights from the experts with whom we have spoken, the issues manifest themselves for different reasons at different ends of the system's life cycle.

According to Doug Fisher, Principal Fire Protection Engineer from Fisher Engineering, Inc., inadvertent foam discharges tend to happen in two scenarios:

1. Early stage system existence – deficiencies and issues arising from poor design or improper commissioning at outset;
2. Late stage system existence – lack of maintenance, particularly near the end of system's life, or the lack of replacement of key components throughout the fire suppression system's life cycle.

Poor design and installation

We have multiple examples of these conditions in our claims data. We have seen cases where a manual fire suppression activation switch was situated near a hangar door and therefore exposed to the weather elements. This created an electrical short in the system that triggered a foam activation.

Cascading electrical failures are a regular contributor to false activations. It can take the form of a power surge after power comes back online, and we have seen inadvertent foam deployments attributed to an electrical spike resulting from lightning strikes.

Less common triggers include infrared imaging sensors locking on to a heat source other than a fire. Heat associated with sunlight reflecting off glass or aircraft engine exhaust triggered deployment of fire foam suppression systems in two of our claim events.

To summarize, it can be very difficult to recover damages associated with foam discharge events. Recovery efforts can be long and arduous without any guarantee of success.

Improper maintenance

We have observed sprinkler and valve corrosion trigger inadvertent deployments. These types of maintenance-related events raise questions around maintenance protocols. Are the inspections being carried out regularly? Should they be more frequent? Was the corrosion just overlooked?

Who is responsible for inadvertent foam discharge events?

You might be surprised to learn that responsibility for a foam discharge event varies widely depending upon the circumstances. Our clients are often shocked to discover that they signed away their rights of recovery against a responsible party.

A lot of finger pointing occurs in the aftermath of an inadvertent foam discharge event. Remember the fine print in the hangar lease you signed for your aircraft? Suddenly the disclaimer language contained in that agreement is invoked against you. Upon closer inspection, you realize the language absolves the landlord for any damage to your aircraft.

What if you are the hangar owner who contracted with a fire suppression system maintenance company? You might assume you can pursue them for the foam discharge event because they were supposed to maintain the system and the foam discharge occurred on their watch.

Not so fast. They have a limitation of liability clause in their contract with you limiting recoverable damages in an inadvertent foam discharge event to – get this - $250!! This actually happened to one of our clients.

To summarize, it can be very difficult to recover damages associated with foam discharge events. Recovery efforts can be long and arduous without any guarantee of success. The contracts around fire suppression system installation and maintenance may not properly contemplate all the remediation costs around inadvertent foam discharge, which could include necessary repairs to an expensive business jet.

Take a look at your contracts. Put more focus on how liability language is used. Consult with your insurance broker or attorney. Make sure the contract is equitable.

What is happening in the industry today to address the inadvertent discharge problem?

Lately some companies are making decisions to actively avoid foam requirements by building smaller hangars. This might mean losing efficiency in certain areas but it eliminates the substantial upfront costs of installing automatic fire suppression, the associated maintenance and operational costs, and false activation risks.

On the industry advocacy front, the National Air Transportation Association (NATA) in recent years has been trying to persuade the NFPA 409 technical committee to modify the requirements for aircraft hangars to a more risk-based approach in lieu of the seemingly arbitrary nature or randomness of certain portions of the standard. NFPA 409 is currently in the midst of a revision cycle and we are optimistic to see a positive proposal for change this year.

Michael France, NATA's Managing Director of Safety & Training, stated: "The National Air Transportation Association (NATA) is working to coordinate efforts across the

general aviation industry to address the requirement for foam fire suppression systems. NATA members have frequently expressed concerns over the impact high installation costs and frequent inadvertent discharges of hangar foam systems has on new hangar development. Additionally, NATA members are concerned that current requirements for foam suppression systems in aircraft hangars need to be reviewed in light of changing risk/benefit factors."

Mr. France goes on to say, "Our members desire to see the fundamental risk/benefit of hangar foam fire suppression systems reexamined in light of industry experience with those systems. Generally, our members believe that the hazard foam systems are designed to address - a large scale, in-hangar release of fuel that then ignites - is very low especially when viewed in light of the high installation and ongoing maintenance costs of these systems. We look forward to working with professional fire engineers and other stakeholders to review the relevant data and provide input on the future of applicable standards."

While the general standards requiring foam fire suppression systems in many aircraft hangars has been in place for decades, Mr. France notes that many airport businesses are seeing a reduced ability to negotiate with local fire marshals on the applicability of those standards.

Mr. Petersen of Willis Towers Watson adds, "The high costs to install, the risks to people and property from inadvertent discharges, and the hundreds of millions of dollars lost because of them are massively disproportionate to the utility of these systems as there is no data showing a foam system has ever been deployed in response to an actual fire and people or property were saved from harm. The prediction is we will see significant changes in the coming years and perhaps very soon. The only thing preventing this from occurring is our industry failing to organize and to demand that the imbalance and inequity be meaningfully addressed. Ultimately, we can achieve improvement in a number of areas such as: 1) the requirements by way of NFPA 409 will be reduced or modified; 2) loss control and preparedness; 3) the risk of loss for inadvertent discharges shifting to the parties who are responsible for designing, installing and servicing these systems."

Some of the recommended revisions to NFPA 409 that will be submitted this summer include:

- Overhauling the hangar classifications and making distinctions between "Storage" and "Maintenance" hangars;
- Beginning the process of moving the standard from a prescriptive approach to protection to a risk-based approach;
- Reducing or eliminating foam fire suppression system requirements in "Storage" hangars and calling for water sprinkler systems instead.

Mr. Dye commented, "Code writers and code users must work together to develop codes which promote growth and prosperity within a safe environment."

What can I do?

Make your voice heard. The industry needs more data to fully understand all the costs arising from foam fire suppression systems as well as the actual risk from large fuel spill fires in hangars. The NATA has launched an industry survey to begin collecting this data. The survey can be accessed at www.nata.aero/foamsurvey

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Train your staff. Take nothing for granted. Lack of employee training is a major contributor to false activation events.

Talk to your fire marshal and ask questions about fire suppression systems. If you are in the market for a fire suppression system, be wary of low bidders who may have to cut corners to provide aggressive pricing.

In addition, here are some recommended best practices to help prevent or mitigate damage from an accidental discharge of a foam fire suppression system:

- Secure the aircraft by closing all doors when aircraft is unattended;
- Cover the engine intake and exhaust openings;
- Test the foam system at night if possible when there is less activity involving personnel and aircraft;
- Develop emergency response protocols around foam deployment situations;
- Follow prescribed maintenance protocols;
- Ensure fire suppression contractors and the actual personnel they send out to your site are knowledgable about the automatic operations of the foam system since the person who visits your facilities for your annual building fire alarm test may not be qualified to test the foam system electrical components like the detection, etc.

Acknowledgments:
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References:
NFPA 409 – Standard on Aircraft Hangars, 2016 Edition
Northwest Florida Daily News

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About Global Aerospace

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Nick Methven joined Global Aerospace in 2002 and has served in multiple underwriting roles across product lines throughout his tenure. He was appointed to the role of Senior Vice President, Underwriting Executive in July 2013, and is currently responsible for leading Global's Manufacturers Product Liability underwriting department and developing underwriting strategy for other product lines. Prior to joining Global, Nick worked for Chubb and was involved in corporate and commercial aircraft underwriting, reinsurance and financial analysis.

Nick received his undergraduate degree in Aeronautical Science from Dowling College in Oakdale, NY and later earned his MBA in Finance from the University of Delaware. Nick is a licensed insurance producer and holds the Chartered Property Casualty Underwriter (CPCU) and Certified Aviation Insurance Professional (CAIP) designations. He is also an instrument rated private pilot.