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ARTICLE

Hangar Infrastructure for Fighter Aircraft Readiness

Eliminating Critical Operational Vulnerability in Fighter Aircraft Hangars

Executive Summary

Modern air forces increasingly maintain fighter aircraft in a near-launch condition. Aircraft are often stored fully fueled and mission-ready inside hangars to protect them from weather, reduce satellite visibility, and enable rapid response.

In this operational environment, hangar fire protection must protect aircraft without introducing operational disruptions.

Traditional foam-based suppression systems can create readiness risks through accidental discharge events that may render multiple aircraft temporarily unavailable.

The **Ignitable Liquid Drainage Floor Assembly (ILDFA)** takes a fundamentally different approach. Instead of suppressing fires **after** ignition, ILDFA removes spilled fuel **before** it can accumulate and ignite.

This passive method provides effective fuel fire protection while eliminating the risk that the fire protection system disrupts aircraft readiness.

Foam Suppression Systems as a Readiness Vulnerability

Foam-based fire protection can become a single point of failure for aircraft readiness.

Traditional foam suppression systems rely on **flame detectors** to trigger a full foam discharge. In a contested environment, this creates a critical vulnerability.

Accidental Foam Discharge at Military Hangar

Explosions or fires anywhere else on the airbase during an attack can activate flame detectors inside nearby hangars. Nearby fires, flash events, or burning debris can trigger the system even though no fuel spill or aircraft fire exists inside the hangar.

If the foam system activates under these conditions, the discharge can immediately affect every aircraft inside the hangar bay.

Another concern is deliberate sabotage. A low-cost drone carrying a small incendiary device could be intentionally flown into a hangar with the objective of triggering the foam suppression system.

The goal would not necessarily be to destroy the aircraft directly, but simply to activate the suppression system and render all aircraft in the hangar temporarily non-operational. Such an event could sideline multiple aircraft and remove critical assets from service during a crisis.

ILDFA eliminates this vulnerability. Because the system does not rely on flame detection or foam discharge, it cannot be triggered by external fire events or intentional activation.

Instead, ILDFA protects the hangar by passively removing spilled fuel before it can accumulate and ignite.

As recent as March 2026 a similar situation to the scenario described above occurred in Iraq.
FPV drone slams into US military base in Iraq

Fighter Aircraft Readiness and Hangar Operations

Rising geopolitical tensions and advances in satellite surveillance have changed how fighter aircraft are housed and maintained.

Air forces increasingly keep aircraft inside hangars rather than on open flight lines because hangars provide:

- reduced satellite visibility
- protection from weather exposure
- improved maintenance conditions
- faster launch readiness

Aircraft stored in these facilities are often maintained in **near-launch condition**, including full fuel loads and rapid start capability.

This operational model increases the importance of hangar infrastructure that cannot inadvertently disable aircraft availability.

ILDFA: Preventing Fuel Fires Before Ignition

ILDFA addresses the fuel fire hazard at its source.

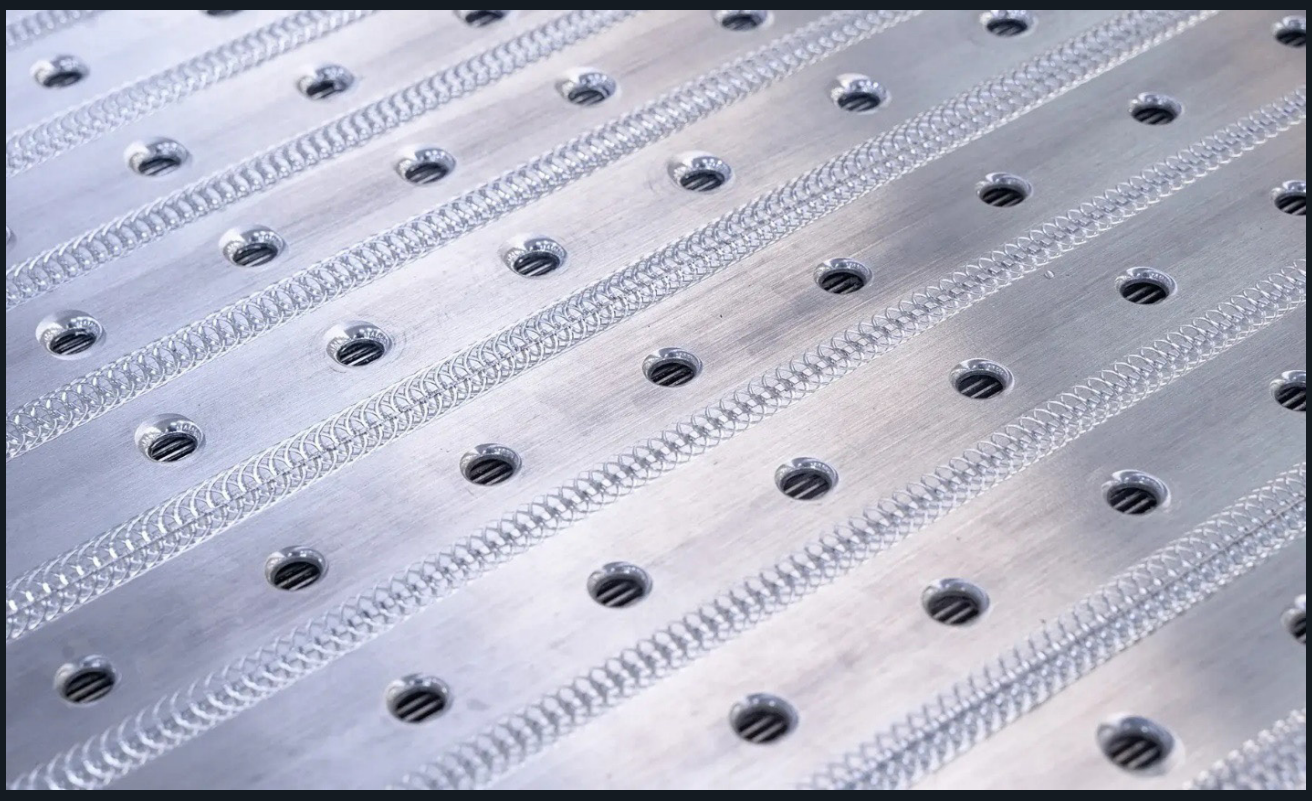
Instead of allowing fuel to accumulate until ignition occurs, the system captures and removes spilled fuel immediately through a specially engineered drainage floor assembly.

By draining the fuel away before a flammable pool can form, ILDFA significantly reduces the probability of a sustained fuel fire inside the hangar.

Because the system operates passively, it does not rely on:

- flame detectors
- heat detection systems
- foam discharge equipment
- chemical suppression agents

This passive design eliminates accidental suppression events and ensures the fire protection system cannot itself disrupt aircraft readiness.



Close up the ILDFA top surface

Operational Advantages for Fighter Aircraft

ILDFA enables greater operational flexibility inside hangars.

Traditional foam systems triggered by flame detection can restrict aircraft operations such as engine start or warm-up procedures inside hangars.

Because ILDFA relies on passive drainage rather than flame detection, aircraft engines can be started and warmed up inside the hangar when the hangar layout allows, without the risk of triggering a suppression system.

This capability can improve operational readiness, particularly in colder climates where engine warm-up prior to taxi is often required.

Engine Warm Up is possible inside the hangar with ILDFA

Reliability in Extreme Climates

ILDFA systems are inherently resilient in both cold and dry environments.

In cold climates, the system relies primarily on dry piping and minimal water use, reducing vulnerability to freezing conditions.

In desert environments, ILDFA provides another significant advantage: **extremely low water demand.**

The system requires approximately **750 liters per minute (200 gallons per minute)** of water, compared with the thousands of liters per minute typically required by foam suppression systems.

This flow rate typically requires no more than a **three-inch water supply line**, significantly reducing infrastructure requirements.

Safespill also offers **fully self-contained ILDFA systems** with integrated water supply and containment, allowing hangar fire protection even at remote installations where water infrastructure is limited or expensive to install.

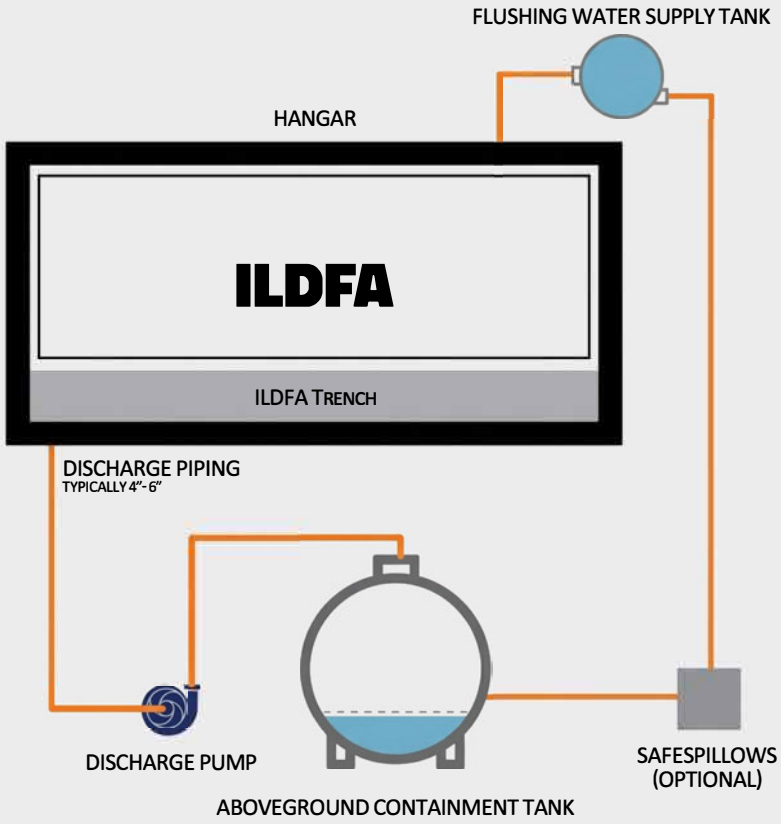


Diagram of a fully self contained ILDFA System set up

Durability and Minimal Maintenance

ILDFA assemblies are constructed from **marine-grade aluminium (aluminum) alloy**, providing exceptional corrosion resistance and long structural life.

The aluminium drainage structure is designed to **outlast the hangar itself**, with minimal degradation over time.

Because the system contains very few moving components and does not rely on complex suppression equipment, maintenance requirements are minimal.

Safespill provides a **10-year warranty** on ILDFA systems, reflecting the durability and reliability of the design.

Deployment and Approvals

ILDFA systems have been installed since **2020**, protecting hangars supporting modern fighter aircraft including **F-16, F-18, and F-35** platforms.

Systems have been installed or are currently being installed in a wide range of operational environments, including **desert installations, cold climate bases, and northern Canadian facilities where extreme winter conditions occur.**

ILDFA is **fully approved under the NFPA 409 standard in both the 2022 and 2026 editions**, is **FM Approved**, and is currently used by multiple military organizations including the **United States Navy and the Royal Canadian Air Force.**

NFPA® 2026 EDITION NFPA 409

NAVFAC Interim Technical Guidance (ITG) FY26-01

FM APPROVED STANDARD 6090

FM Property Loss Prevention Datasheet 7-93

Conclusion

As air forces maintain aircraft at higher readiness levels, hangar infrastructure must support continuous operational availability.

Fire protection systems must not compromise operational readiness.

ILDFA achieves this by:

- preventing fuel fires before ignition
- eliminating suppression system vulnerabilities
- delivering long-term durability with minimal maintenance
- enabling flexible hangar operations
- operating reliably in extreme climates

For fighter aircraft hangars designed to support rapid response and continuous readiness, passive fuel drainage provides a practical and resilient fire protection solution.

For more information visit www.safespill.com