Military Aircraft Fueling Facilities

Gammon Fuel Symposium - 2025

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BRYAN STRAYER – Mechanical Engineer

- 25 Years at Austin Brockenbrough & Associates – Vast Majority of Experience in DoD POL Systems
- Mechanical Engineering Technology Degree from Penn State University
- Worked under Vince Benedetti – Retired and left some big shoes to fill
- Licensed PE in Virginia; API 570 & 653 Certified Inspector, STI SP001 Inspector
- SAE Committee AE-5C Chair

MILITARY AIRCRAFT FUELING SYSTEMS

- **Facilities Vary from Very Small to Very Large Systems**
- **Variety of System Types:**
  - Refueler Truck Fill
  - Hydrant Pit Issue
  - Fueling Cabinet
  - Exotic Systems
- **Many Similarities to Commercial Systems, but also Some Key Differences**
- **Locations all across the Country and All Around the World – All Under a Single Authority**

SIMILARITIES to COMMERCIAL SYSTEMS

- **Receive, Store, and Issue Clean Fuel to Aircraft**
- **Adhere to General Industry Standards:**
  - API, STI
  - NFPA
  - CFR
  - State and Local Requirements
- **In General Use Similar Components**
  - Pumps, Filters, Meters
  - Piping, Valves, Appurtenances
  - Adapters and Connectors

MILITARY SYSTEMS – Fuel Types

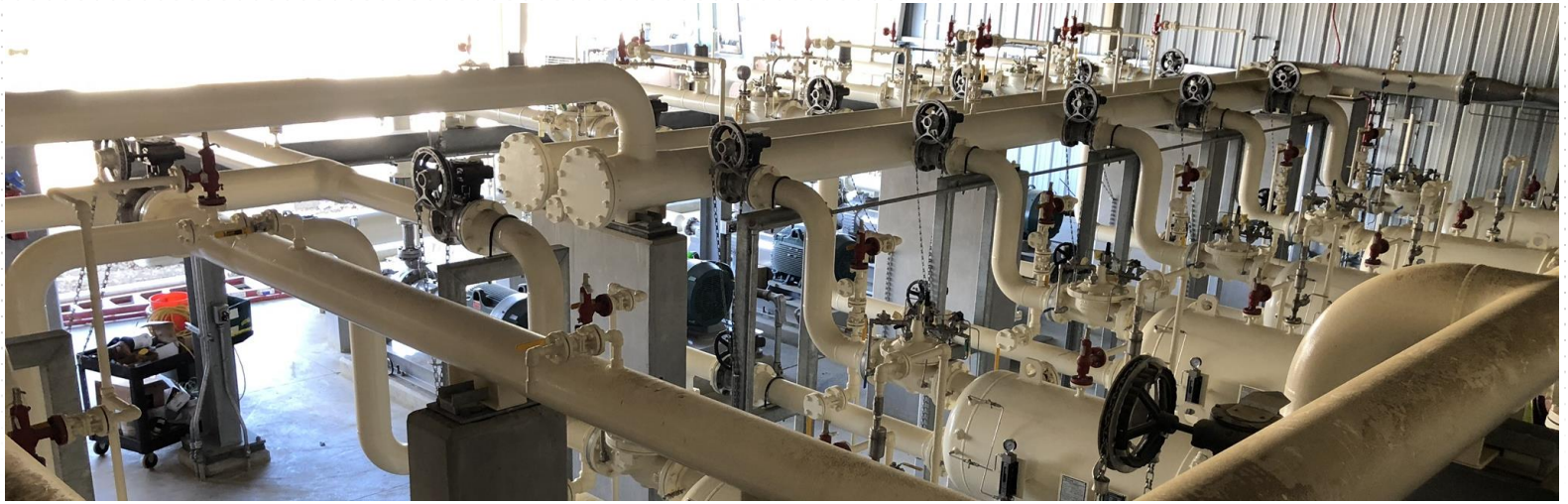
- **Specialized Fuel Blends (JP-8, JP-5, F-24): Specific Additive Requirements for Mission Applications**
- **Fuel Quality: On-Base Bulk Storage or DFSP Distribution**

MILITARY SYSTEMS – Standardization

- **Fuel Facilities Constructed to Detailed DoD Standards:**
  - Type III Hydrant System
  - AST Standard
  - Cut-and-Cover Standard
  - UFGS Standardized Specifications
- **Allows Qualified Personnel to be Moved to Different Locations and Still Remain Proficient**

MILITARY SYSTEMS – Robust Installations

- DoD Standards for New Construction are Typically more Heavy Duty
- “Belts & Suspenders” Approach for many items
- Mission Critical Facilities – National Defense. Failures are Unacceptable
- Less Routine Maintenance Available; Lack of Capacity for Repair Service, Especially in an Emergency Situation



MILITARY – Simple Controls

- DoD Standards do not typically have provisions for complicated electronic controls.
- Some Energy Inefficiency is a Trade-Off for better reliability.
- Old Fashioned and Time-Proven Hydraulic and other Self-Powered System Components.
- Wide Range of Operators with different skill levels. Simpler is better.
- Allows Operations to Move Forward even if the Power goes out.

MILITARY SYSTEMS – System Capacity

- DoD Systems are typically sized for the Worst-Case Scenario per Mission Requirements
- Typically appear oversized for daily operations
- Applies to Storage Capacity, Pumping/Issue Capacity, Number of Connection Points

MILITARY SYSTEMS – Unique/Exotic Systems

- Rotary and Fixed Wing Aircraft Fueling at the Same Locations
- Refueling Lanes with Cabinets and Hoses or Pantographs
- Hot Refueling Positions for “Gas-and-Go” operations

MILITARY SYSTEMS – Unique/Exotic Systems

- **Chilled Fuel Systems – Fuel is refrigerated to lower temperature and used as a coolant fluid for high-heat electronic components**
- **Used on some of the newest Fighter and Interceptor aircraft**
- **Tanks and Piping are insulated to maintain low temperature of fuel product**

MILITARY SYSTEMS – Current Trends

- **Cybersecurity Measures – Global Fuel Monitoring Systems**
- **Ever-Changing Anti-terrorism Measures**
- **Inspection Cycles for Tanks and Piping – DoD Adopting inspection periods more like commercial facilities**
- **Risk Based decisions on Repairs; Mandatory and Required vs. “Nice to Have”**

MILITARY SYSTEMS – Summary

- In General components and operations are similar
- But many distinct differences due to mission critical nature and Worldwide distribution of Facilities
- If aircraft fueling is a niche, DoD POL fuel systems are somewhat of a specialty within the niche

QUESTIONS?