U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND – GROUND VEHICLE SYSTEMS CENTER

ARMY FUELS

Jill M Bramer
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AGENDA

- History
- Commercial & Military Fuel Distribution
- Use of Commercial Fuels
- Diesel Fuel
- Challenges with Commercial Diesel
HISTORY

• Prior to 1960s – Army operated on gasoline

• 1960s – 1980s → Used Diesel Fuel (F-54)
  o Major Problem: Waxing @ low temps

• 1981–1988 → M1 Fuel Mix AKA NATO F-65
  o Started in Germany in 1981
  o Blended F-54 Diesel with kerosene aviation fuel (JP-5 or JP-8)

• 1988 → Implemented Single Predominate Fuel, JP-8
  o Field test at Fort Bliss from October 1988 through July 1991

• 2013 to present → Conversion to F-24 in CONUS
  o Official notification via ALARACT 113/2013 (30 April 2013)
  o Complete conversion in December 2014
COMMERCIAL FUEL DISTRIBUTION
USE OF COMMERCIAL FUELS

• DOD has moved to commercial fuels
  • Except JP-5 & F-76
  • Aviation fuels must still be additized to meet military requirements

• Logistically easier & cheaper to pull product off the pipeline
  • Led to cancellation of military specifications for MOGAS, DIESEL

• DOD has limited control over specifications

• Commercial fuels are intended for near-term use; military stores & consumes fuels at a slower rate

• DOD does not align with commercial practices for particulate contamination and filtration for diesel engines and fuel injection systems
DIESEL FUEL

- Commercial Off The Shelf (COTS) diesel engines are optimized for diesel fuel
  - ULSD required for diesel engines with modern emission controls

- Commercial diesel fuel properties have advanced to meet new hardware requirements & country emission regulations

- Major Differences between Jet Fuel and US Diesel
  - US commercial engines are optimized for ULSD
  - Energy content
  - Cetane Number
  - Lubricity
  - Viscosity
  - Sulfur Content (modern emission controls)

- US Diesel Fuel
  - DF2 is not specific to a sulfur content level.
  - DF2 15ppm (Ultra Low Sulfur Diesel) is most common
CHALLENGES WITH COMMERCIAL DIESEL

- Worldwide Diesel Fuel Specifications
  - US commercial engines are optimized for local diesel fuel
  - Not harmonized across the world
  - Spec updates driven by changes in emission standards & engine advances

- Availability
  - ULSD not available all over the world; sulfur content varies by country

- Low Temperature Operability
  - Diesel fuel is seasonal & regional
  - Ambient temperatures would have to be monitored to prevent gelling

- Storage & Handling
  - Addition & segregation for diesel supply chain

- Diesel Exhaust Fluid – is NOT a fuel additive
  - Addition to supply chain
  - Risk to ground vehicles and aircraft

- Implications to Army Force Structure & Installation infrastructure
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