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

ARMY FUELS

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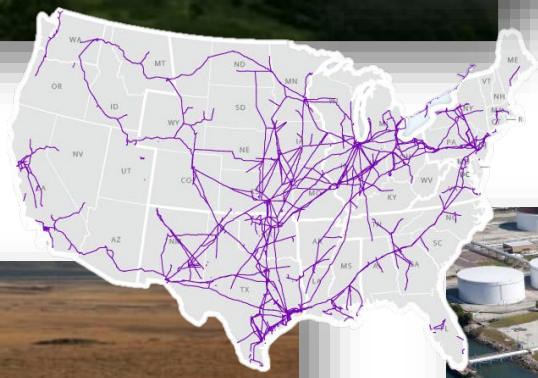
AGENDA

- 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)**
  - Major Problem: Waxing @ low temps
- **1981–1988 → M1 Fuel Mix AKA NATO F-65**
  - Started in Germany in 1981
  - Blended F-54 Diesel with kerosene aviation fuel (JP-5 or JP-8)
- **1988 → Implemented Single Predominate Fuel, JP-8**
  - Field test at Fort Bliss from October 1988 through July 1991
- **2013 to present → Conversion to F-24 in CONUS**
  - Official notification via ALARACT 113/2013 (30 April 2013)
  - Complete conversion in December 2014

COMMERCIAL FUEL DISTRIBUTION



MILITARY FUEL DISTRIBUTION

DISTRIBUTION A. Approved for public release. Distribution is unlimited.

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