Fuels Systems
Petroleum, Oil & Lubricant (POL)
Technical Center of Expertise (TCX)

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Overview

- Key Points
- Organization
- Capabilities
- Fueling Systems
  - Type III
  - Cut & Cover
Key Take-Aways
Fueling Systems Center of Expertise

Recognized Authority for Military Fuel Storage & Delivery Systems

- 31 Years of Fueling System Expertise
- Mission Statement
  - Design/Construct Fuel systems to provide “Clean, Dry” Fuel Reliably and Safely.

- Capabilities
  - Support to Army, Air Force, Navy
  - Develop & update DOD Standard Designs
  - Nationwide SRM and OCO Support
  - Experienced Government Fuels Engineers
  - Technical Guidance to Industry
  - Fuels-specific A-E and D-B contracts

Consistency + Contingency = Quality
Fueling Systems
Center of Expertise (POL-TCX)

- Support for high-volume fueling systems (35-1,200+ gpm)

### Services Provided
- Guidance
- Programming
- Review
- Design
- Construction inspection support
- Acceptance testing support services
- Develop and update standards

### Systems Supported
- Bulk fueling facilities
- Fuels laboratories
- Refueler parking & maintenance facilities
- POL pipelines
- Fueling facilities
  - Aircraft
  - Marine
  - Ground vehicle
Mission Statement

- Design/Construct Fuel systems to provide “Clean, Dry” Fuel Reliably and Safely.
Locations of Fuels Projects Supported by POL-TCX

Consistency + Contingency = Quality
Misawa AB, Japan
Hardened Aircraft Shelter
Hill AFB, Utah
Performance Testing On Fixed-Wing Aircraft
Westover Air Reserve Base, Massachusetts
Performance Testing Using Fixed Aircraft
Fort Hood, Texas
Performance Testing Using Rotary Wing Aircraft
Offutt AFB, Nebraska
Type III Pumphouse
Hill AFB, Utah
Construction of Type III Pumphouse and Operating Tanks
Al Musanah Air Base, Oman
Cut & Cover Tanks, Filter Building, Truck Offload, and Truck Fillstand
POL-TCX Organization

PRIMARY BUSINESS LINES

Criteria and Standards & Support for Others

MILCON

SRM

SECONDARY BUSINESS LINES

UFC 3-460-01 and UFGS

Pressurized Hydrant Fueling Systems Type III, IV, V

DOD OUTF Cover & aboveground Storage Tank Design Standards

Fuels Labs & Rotary Wing Design Standards

OCONUS Design and Commissioning (FOB)

Technical Reach-Back to Other Districts

DLA Minor MILCON

Requirements Document

35% Design

100% Design

Title 2 Services

Leak Detection, STI, & API 653 Inspections

STI & API 653 Repairs

SRM & Project Planning Studies

Emergency Response

Recurring Maintenance & Minor Repair
POL-TCX Resources

Planned additions shown in blue
* Indicates partial support to Fuels Program when needed

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Special Projects Construction Office
Patricia Henry

Defensive Energy Services
Mary Anderson

Contract Administration
Todd Hudson

Quality Assurance Representatives
Jason Hanes
Mike Blalock
Virtual Team Members

Special Projects Design

Mechanical (5)
Electrical (4)
Structural (2)
Civil (3)
Cost (2)
Architecture (1)
Artificial Ponderosa (2)

$250M E400

Large DB
Large DB
Large DB
Large DB

$250M S1000

Large DB
Large DB
Large DB
Large DB

$250M S1000

Large DB
Large DB
Large DB

Contracting Office

Doug Mooney
Linda Richards
Anjuli Stark
Kip Stiller
Daryl Backlund

$250M E400

Large DB
Large DB
Large DB

$250M S1000

Large DB
POL-TCX Workload

- Direct-funded requests:
  - Sister Districts (OCO, DLA, Bed Down, & other Projects)
  - DLA-Energy SRM
  - Directly from the funding Agency other than DLA (Air Force, Army, Navy)

- POL-TCX executes an annual average of $80M
  - $7M in design support of projects executed by other Districts
  - $68M in design support of DLA-Energy projects executed by Omaha District
  - $5M in S&A funds for post-construction award support
Contract Capabilities

- Fuels A-E
  - CONUS and OCONUS capability
  - $45M shared contract capacity amongst 5 A-E firms ($31.5M remaining capacity);
  - $49.9M replacement contracts FY17

- Fuels $490M SRM Design/Build MATOC
  - CONUS
  - MILCON and SRM
  - Available FY16

- Leak Detection
  - $90M leak detection testing and response to suspect leak locations, with minor repairs
  - Available FY16
Time-Sensitive Support Capabilities

- Rapid/Immediate Response Center of Expertise
  - Mission: provide worldwide time-sensitive and non-time-sensitive support of homeland security/defense, disaster, and infrastructure work where a discretionary and or flexible cost reimbursement contract mechanism
  - Contracts
    - Rapid Response Environmental
    - SDIC (Security, Disaster, Infrastructure, Construction)
  - DLA-Energy Support
    - Fuel Spill Response
    - Emergency Repair
Key Components of Fuels Projects

- A successful Fuels project requires qualified fuels personnel to perform three (3) **key components** of a project, and any project will fail if one of them is missing:
  - Qualified Fuels design engineers with experience in **designing military fueling systems** in conformance with current UFC, UFGS, and applicable standards.
  - Government Fuels engineers experienced in the **design and commissioning** of fueling systems to ensure that projects are executed in the best interest of the Government.
  - Qualified fuels **design and construction contractor** with experience in executing military fueling systems in conformance with current UFC, UFGS and applicable standards.
Impacts If All 3 Components Are Not Met

- Impacts if all three (3) components are not met:
  
  ► **Reduced safety**
    - Lessons learned from previous accidents involving safety have been incorporated into the standards by the POL-TCX.
    - There have been occurrences in the past where the Geographic District are not familiar with known safety concerns, and because of their failure to understand and comply with the standards, can result in safety violations.
  
  ► **Failure to Meet Mission Requirements**
    - Mission failure (inability to achieve required flow/pressure/quality levels, damage to weapons systems) can result when a designer does not have the experience or capabilities to correctly configure a fueling system for a particular mission.
    - Inability to comply with standard designs can result in increased training periods and safety risks for operators.
Impacts If All 3 Components Are Not Met

► Increased Cost
  • Redesign, construction re-work, and increased quality assurance checks can result in increases to project cost that are in some cases unrecoverable.

► Schedule Delays
  • Additional time required to perform redesigns and/or construction re-work can delay handover of the system and may result in damages.

► Funding Agency Dissatisfaction
  • Redesign and construction re-work, and inconsistent quality or service can result in the funding Agency losing trust in USACE.
  • These funding Agencies typically have alternative options for executing their program.
Miami Airport
Fuel Farm Fire
Offutt AFB, Nebraska
Collapsed 10K barrel tank, pumphouse, and containment
Eglin AFB, Florida
Truck Offload
Hill AFB, Utah
Contaminants in uncovered pipe
Damaged Vibration Dampener
Andrews AFB, MD
Aboveground Piping
Eglin Air Force Base, Florida
Type III Pumphouse
Altus AFB, Oklahoma
Aboveground Piping
SRM Methodology

Scope Development

Project and cost validation

Funding Acceptance

POL Mailbox

Oversight of commissioning

Project Completion

Contract Administration

USACE POL-TCX

Selected by POL-TCX to only support DLA-E Fuel-SRM projects

Compliance with all applicable requirements

Scope changes accomplished with reach back into POL-TCX

Design Review

Change Approval

MATOC Award (Design/Build)

Selected by POL-TCX to only support DLA-E Fuel-SRM projects

Compliance with all applicable requirements

Scope changes accomplished with reach back into POL-TCX

Design Review

Change Approval
Bagram Air Base, Afghanistan
Cut & Cover Tank and Filter Building
Al Musannah Air Base, Oman
Filter Building
DEPARTMENT OF DEFENSE
PRESSURIZED HYDRANT FUELING
SYSTEM TYPE III
Typical Type III Layout

PUMPHOUSE

FILTERS

PUMPS

PRODUCT RECOVERY TANK

RECEIPT LINE FROM BULK STORAGE

TWO 10,000 BARREL TANKS

JET FUEL JP-8

ISSUE

RETURN

RECEIPT
Flow of Fuel on a Typical Refuel

- Jet Fuel (JP-8)
- High Level Shutoff Valve
- Defuel/Flush Valve
- Back Pressure Control Valve
- 2" Pressure Control Valve
- Return Venturi
- Hydrant Control Valves
- Refueling Loop
- Pump Discharge Control Valve
- Filter Separator Control Valve
- Issue Venturi
Flow of Fuel on a Defuel With Pumps Running

2. Pump Discharge Control Valve
3. Filter Separator Control Valve
4. High Level Shutoff Valve
5. Defuel/Flush Valve
6. Back Pressure Control Valve
7. Return Venturi
8. 2" Pressure Control Valve
9. Refueling Loop
10. Refuel Aircraft
11. Defuel Aircraft
The number of outlets will vary from one system to another depending on the needs of the particular aircraft type and number of aircraft it will support. Some Type III systems have some outlets for large frame aircraft and others for fighter Hot Pits. It also has isolation valves between groups of outlets in order to perform maintenance and continue operation to the other outlets.
The Control Panel

- Alarm Panel
- Transmitter Displays
- System Controls

PLC and I/O Panel

System Monitoring Panel
CONUS Location
Type III Pumphouse
Dyess AFB, Texas
Type III Pumphouse
Offutt AFB, Nebraska
_Type III Pumphouse_
Andrews AFB, MD

Isolating flange, overvoltage protector, & dust cover
Hill AFB, Utah
Construction of Type III Pumphouse and Operating Tanks
Hill AFB, Utah
10K barrel tank
Hill AFB, Utah
Covered hydrant piping with lateral
McConnell AFB, Kansas
Phasing of Hydrant Fueling System Construction
Typical Type III Outlet Pit
Type III Outlet Pit...What’s Inside?

Parking Ramp Surface

- Low Point or Maint.
- Isolation Valve
- Fuel from Loop

Air and Fuel Connections

- Hydrant Adapter
- Pressure Gage
- Hydrant Control Valve

PRV
Hill AFB, Utah

Performance Testing Using Hydrant Hose Truck and Tanker
Ellsworth AFB, South Dakota

Refueling of B-1
Bagram Army Airfield, Afghanistan
Cut & Cover Tank
Bagram Army Airfield, Afghanistan
Cut & Cover Tank
Bagram Army Airfield, Afghanistan
Cut & Cover Tank
Al Musanah Air Base, Oman
Cut & Cover Tanks, Truck Offload, and Truck Fillstand
Al Musannah Air Base, Oman
Cut & Cover Tank
Bagram Air Base, Afghanistan
Cut & Cover Tanks
Camp Humphreys, South Korea

Cut & Cover Tanks, Filter Building, and Rail Offload
Al Musanah Air Base, Oman
Cut & Cover Tanks, Filter Building, Truck Offload, and Truck Fillstand
Bagram Army Airfield, Afghanistan
Cut & Cover Pumphouse
Fuel Systems need to provide Clean, Dry Fuel Reliably & Safely!

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