Fuel Usage Study Extended Demonstration (FUSED)

Sept 15, 2021
Agenda

• Big Picture
• FUSED Overview
• Past FUSED studies
• Future FUSED studies
• FUSED and you
“My logisticians are a humorless lot. They know they are the first ones I will slay if my campaign fails.”

– Alexander the Great

“The line between disorder and order lies in logistics...”

– Sun Tzu
Big Picture – Questions of Supply

over 70 years of undisputed naval dominance

• Do we still have the logistics capacity to support a full force conflict?
• Do we even know how much fuel that will take?
FUSED Overview - Introduction

FUSED is a deterministic model to estimate fuel needs for battlegroups and supply ships.

- What Ships in Theater?
- What Battlegroup Operations?
- What Operating Practices?
- Fuel Consumed → Battlegroup Replenishment Needs
- Resupply Ship Schedule → Oiler Fuel Needs
If you know what a ship is doing, and how it’s doing it, you can estimate its fuel consumption at a given time.
Different operational behaviors impact fuel consumption, often trading risk tolerance for efficiency.

- More Redundancy
- More Efficiency

- Single Generator Operations
- Trail Shaft, Conservative Transits

- Redundant Generators Online
- Full/Split Plant at Low Speeds
Fuel consumption determined by modeling battlegroups carrying out a mission with two different sets of operational practices for comparison

Case 1:
- Transit to Op Area 1
- Conduct ASW Ops
- Transit to Op Area 2
- Conduct CSG Ops
- Transit to Port
- Replenish in Port
- Transit to Op Area 3

Case 2:
- Transit to Op Area 1
- Conduct ASW Ops
- Transit to Op Area 2
- Conduct CSG Ops
- Transit to Port
- Replenish in Port
- Transit to Op Area 3

RAS
Past FUSED Studies – Fuel Conservation

FUSED was used to model how different operating practices would impact fuel use

- 120 gal/hour
  - Single Generator
  - Idling

- 150 gal/hour
  - Remove PIM Window
  - TFP / OTTER

- 450 gal/hour
  - Reduced Plant Mode
  - Lower Fuel Safety Level

- More flexible logistics

15% transit fuel savings

Second Order Effects

Operations

Standby

Transits
FUSED was used to compare NAVEUR fuel demand against available transport assets

- **Naval Combatants**
  - Supply fuel to surface combatants conducting ASW and Amphibious Assault Operations

- **Tanker Escorts**
  - Supply fuel for tankers bringing fuel into theater and shuttling supplies to combatants

- **Ground Forces**
  - Supply ground forces with fuel brought in from across the Atlantic
Past FUSED Studies - NAVEUR

Questions answered:

- How much fuel is needed?
- How many CLF and Tanker ships are needed?
- How much fuel can current assets deliver?
- What are the capability gaps?
Future FUSED Studies – Single Fuel

FUSED will be used in FY22 to model how switching to a single fuel type impacts fuel demand and replenishment logistics.

**Pros**
- Lower Reserve Stocks
- More Operational Flexibility
- Global Availability

**Cons**

Diagram showing:
- Demand
- Transport
- Diversification of Supply
Focus Questions:

• Where to preposition fuel? How much?
• How does single fuel impact capability gaps?
• How does availability of JP5 impact logistics?
Future FUSED Studies- Possibilities

- Electric Ship / Hybrid Electric Drive
- Fuel Distribution for Marine EABO
- FFG(X) Fuel Tank / Endurance Requirements
- Acquisition: More CLF Ships, Tankers, or Combatants?
- Red FUSED: What are Adversaries’ capabilities?
- Munitions, Food, Etc
Studies using FUSED can be funded directly or through ONR Naval Research Program

- Can build in additional capabilities as needed
- Low-cost R&D
- NRP – Find a topic Advocate (N4)
Questions