



Calhoun: The NPS Institutional Archive
DSpace Repository

Faculty and Researchers

Faculty and Researchers' Publications

2022

EUCOMs POL Capability & Capacity Gaps Single Fuel Concept Follow On

Ferrer, Geraldo; Hancock, Michelle L.; Hahn, Eric; Naylor,
Brandon L.

Monterey, California: Naval Postgraduate School

<https://hdl.handle.net/10945/71841>

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

Downloaded from NPS Archive: Calhoun



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>

Summary

- We explored how switching to a single fuel operational concept will impact POL capability gaps.
- We used NPS-developed Fuel Usage Study Extended Demonstration (FUSED) model to evaluate our capabilities to operate in theater using currently available assets.
- We compared operation under a single fuel concept (JP-5) with the performance with using two fuels (JP-5 and F-76).



Scenarios

DAYS	PRE-ASSAULT (PA)	ASSAULT (AST)	FLIGHT OPERATIONS (FO)	SUSTAINMENT (SUS)
10 Days ALL	10 days	10 days	10 days	10 days
7 DAY FO	10 days	10 days	7 days	10 days
7 DAY PA	7 days	10 days	10 days	10 days
7 DAY SUS	10 days	10 days	10 days	7 days
7 DAY AST	10 days	7 days	10 days	10 days
13 DAY FO	10 days	10 days	13 days	10 days
13 DAY PA	13 days	10 days	10 days	10 days
13 DAY SUS	10 days	10 days	10 days	13 days
13 DAY AST	10 days	13 days	10 days	10 days

- A Carrier Strike Group (CSG) and Amphibious Readiness Group (ARG) were required to transit from Souda Bay, Greece to Loch Striven, Scotland.
- Transit with multiple operations (Flight Operations, Pre-Assault, Assault and Sustain) explored effect that single fuel concept (SFC) would have on refueling time and number of replenishments.
- JP-5 energy content was tested from 97% to 100%.

Ship Configurations

Sample Result

	Dual Fuel (JP-5 and F-76)	Single Fuel (JP-5)
Total Refuel Time	94 hrs	89 hrs
Number of RAS required	5	4
Total Fuel Required	6.1 Mgal	5.5 Mgal

- Savings are due to
 - Lower number of RAS
 - Fewer CLF trips to port
 - Increased efficiency of pooling resources
- Observations:
 - JP-5 and F-76 have same energy content in this case.
 - Cases with lower JP-5 energy content provided similar results.

Findings

- In all scenarios, single fuel retained or reduced the number of RASs required.
- In most cases the total number of CLF trips to port and total number of RASs was reduced.



Researchers: Professor Geraldo Ferrer, Department of Defense Management; Mr. Eric Hahn, Energy Academic Group; Mr. Brandon Naylor, Energy Academic Group
 LCDR Rosanne Witt, SC, USN, Operations Research Department
 Topic Sponsor: N4 – Fleet Readiness & Logistics