



Fuel Support for EAB Operations 2045



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Meanwhile in Congress...

House Committee Raises Doubts About US Navy's Indo-Pacific Logistics **Reuters, 17 January 2024**

“... doubts about a **plan to move fuel** from Hawaii to storage facilities across the Indo-Pacific and warning that the U.S. military risks being unprepared for a possible conflict.”



AGENDA

- Scenario and Force Laydown
- Assets
- JP-5 as the Single Fuel
- Re-Supply Options
- Notional Re-Supply Network Diagram (RASP)
- Results



EABO 2045



Background

Adversaries in the Indo-Pacific AOR have challenged the United States' ability to maintain sea control and air superiority by fielding long-range systems designed to keep U.S. forces away from its target operating areas, partners, and allies.



Project Scope

Scenario-based EABO fuel demand and optimal delivery strategy to get **fuel from specific fuel points to contested AOR using TAOL, LSM, and Liberty Lifter**. Logistical support of other units in AOR are excluded from this capstone scenarios.



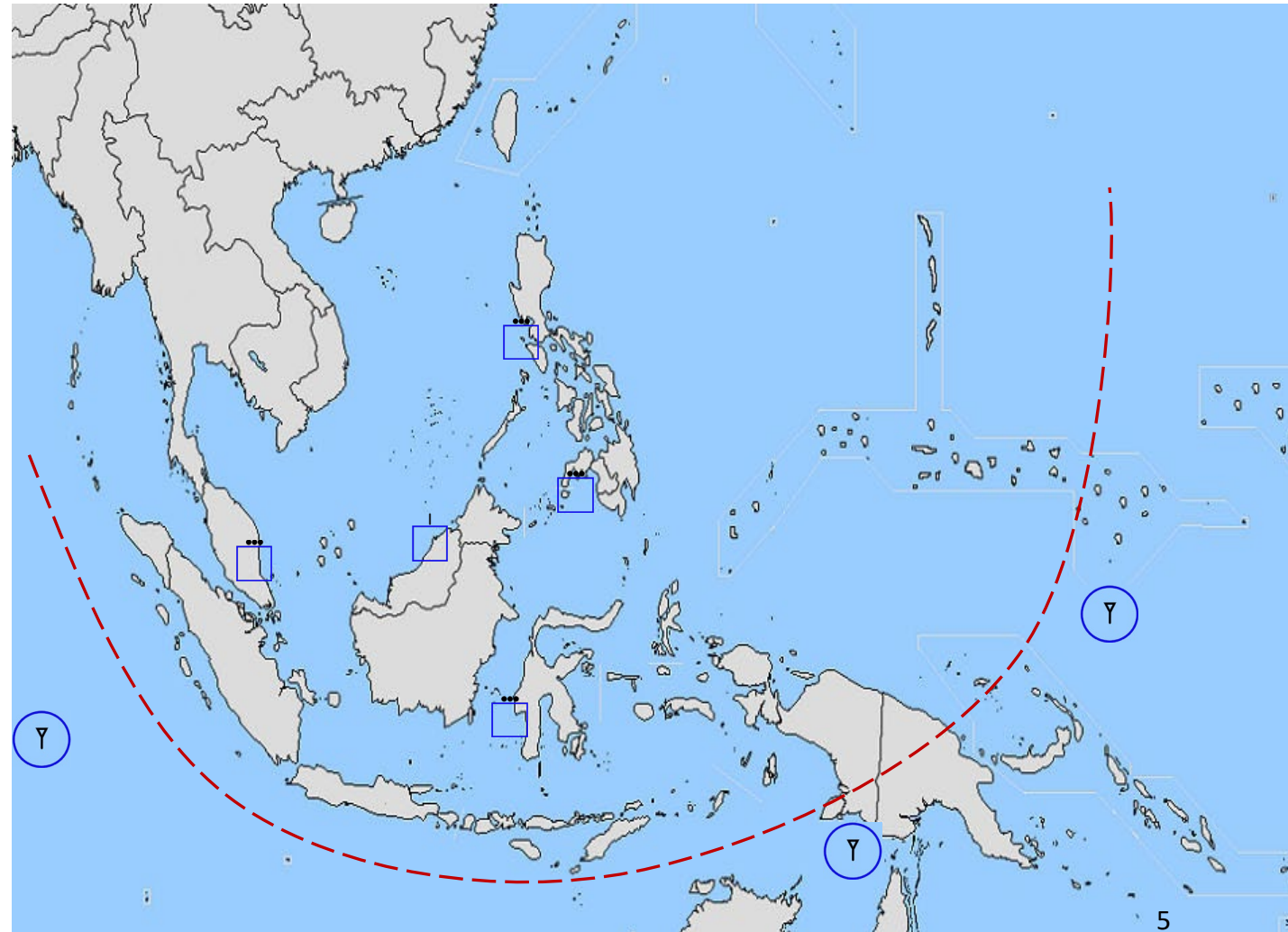
Force Laydown

- Base Scenario:

- 3d MLR EAB Company+ established in Brunei to conduct Theater Security Cooperation (TSC).
- 3d MLR not fully equipped to conduct major combat operations.

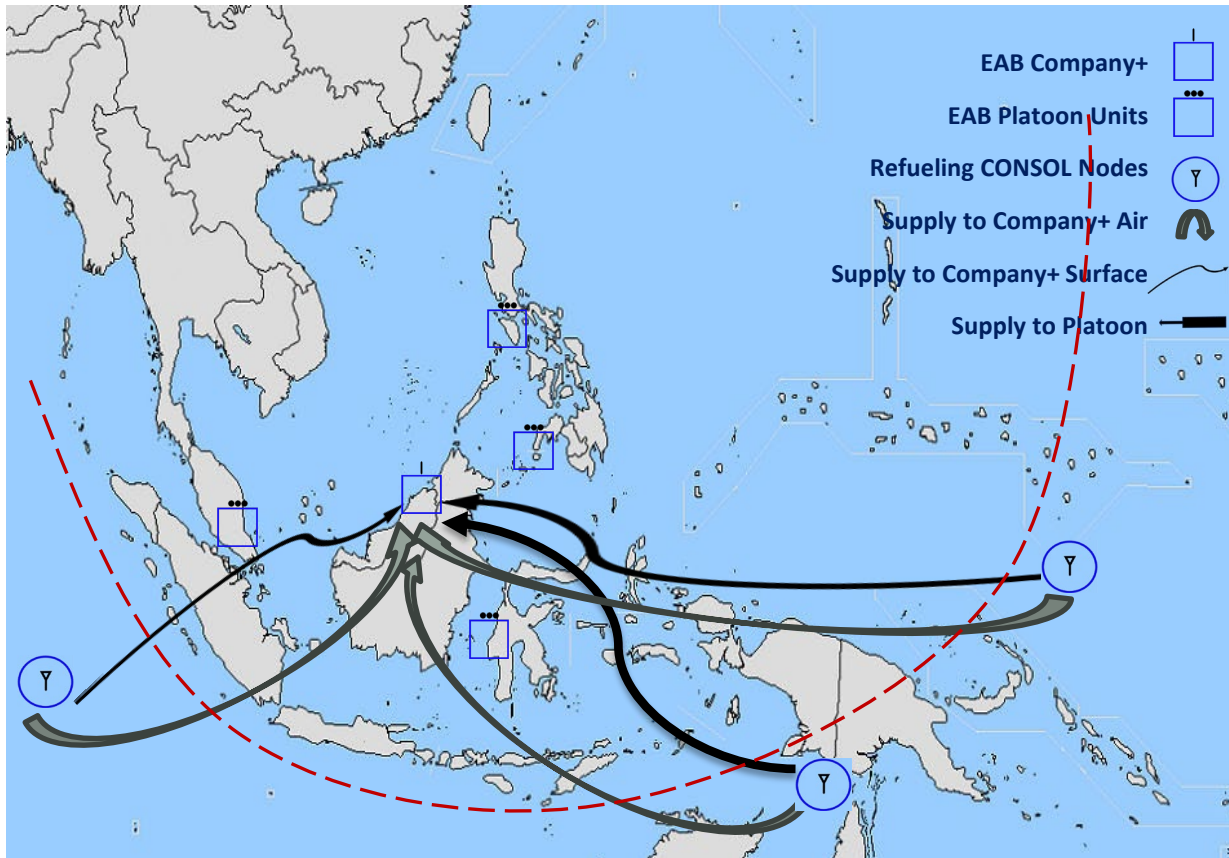
- EAB Configuration:

- 3d MLR HQ (Support not in scope)
- Alpha Company+, 3d MLR
- 1st Plt+, Alpha Company, 3d MLR

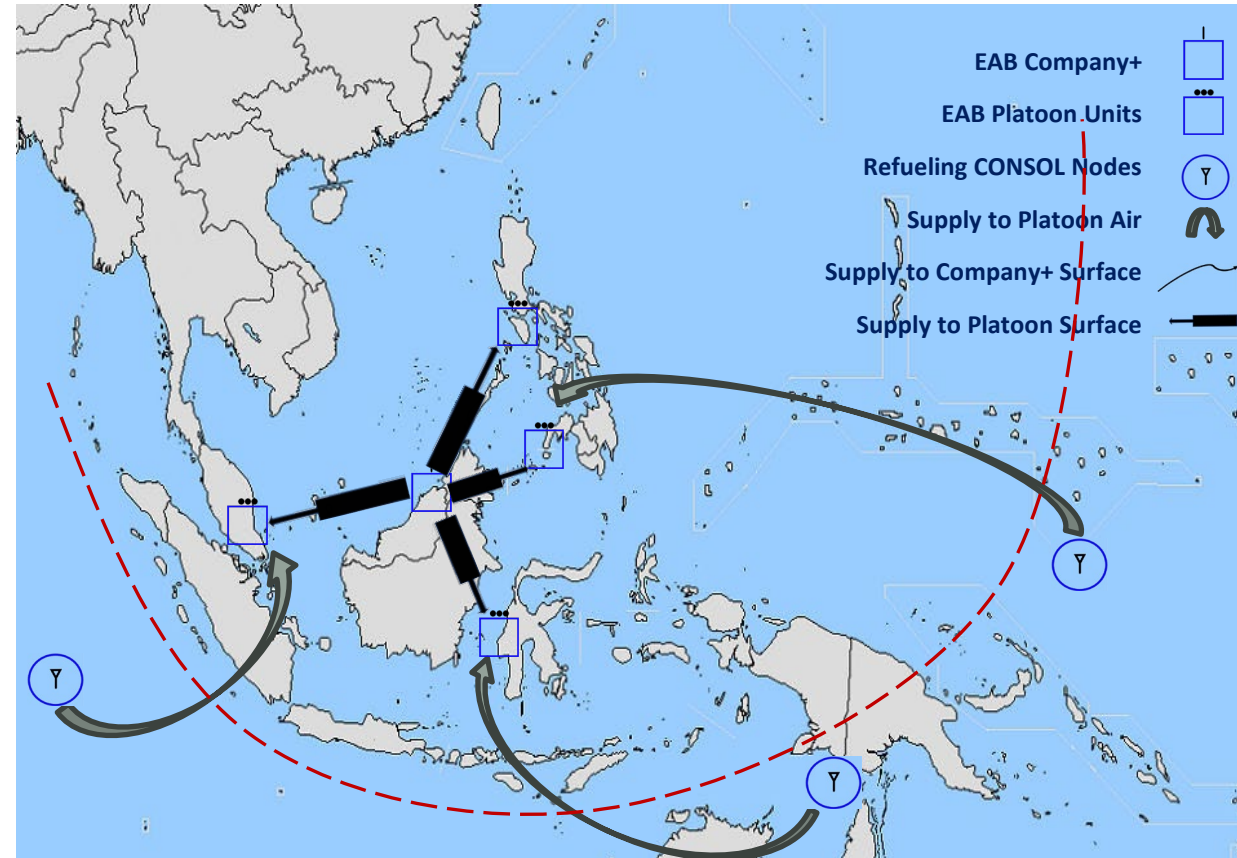


Resupply Options

Resupply to Company via Air & Sea



Resupply to Platoons from Company or CONSOL





Light Replenishment Oiler Platform Supply Vessel (PSV)

Speed: 15-17 knots

Range: 3,500 nm

Capacity: 1.575 Mgal

Cargo: 800-900 tons





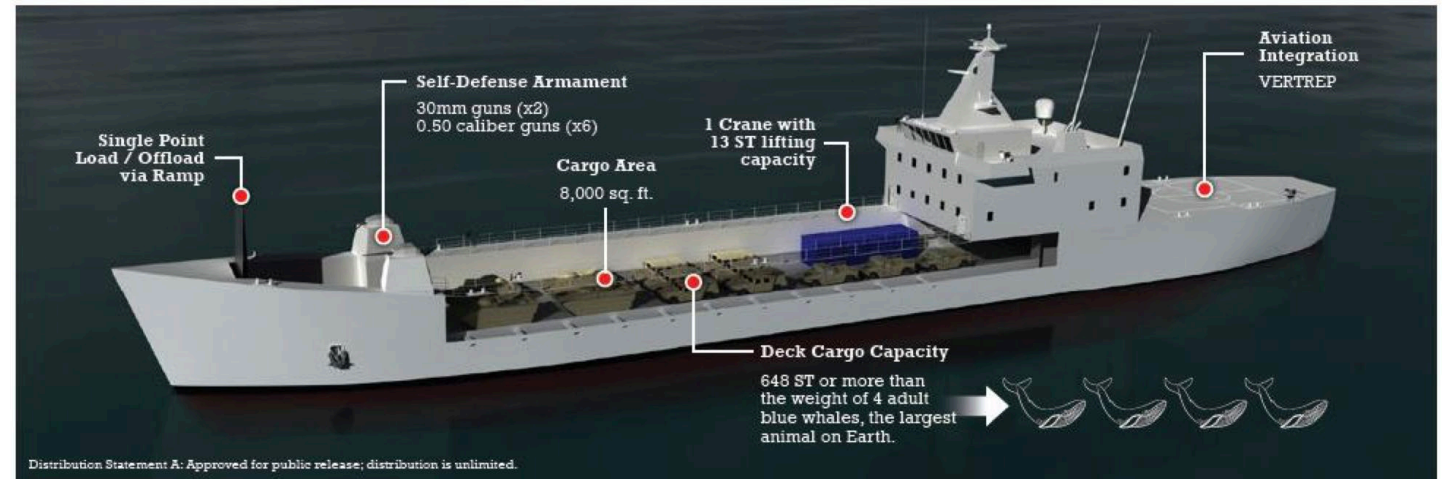
Medium Landing Ship (LSM)

Speed: 14 knots

Range: 3,500 nm

Capacity: 90,000 gal

Deck cargo area: 8,000-12,000 sqft



Liberty Lifter (*DARPA concept*)



Liberty Lifter (DARPA Concept) General Atomics

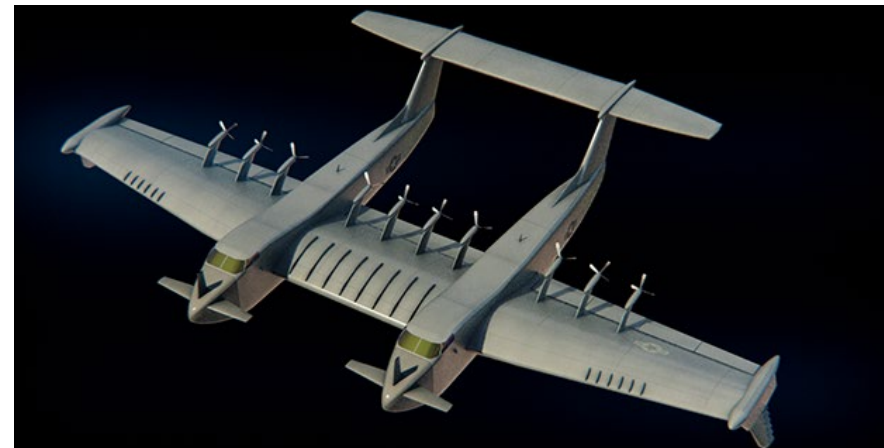
Capacity: 180,000 lbs

Cargo area: 1,440 sqft

=> 12x 463L air cargo pallets

=> 20x SIXCON fuel tanks, 900 gallons each

- Primarily designed for EABO
 - Phase 2: 2024
 - Phase 3: 2026
 - Manufacturing: 2028
- Speed: 145-180 knots
- Sea State ≤ 5
- Range: 8,000 nm





Petroleum Fuel in the US Navy

○ F-76 (or DFM)

- Military grade diesel
- Flashpoint > 140F
- Readily available globally
- Contains additives to provide lubricity

○ JP-5

- Standard fuel for USN aircraft
- Flashpoint > 140F
- Limited availability
- Additives to inhibit corrosion and icing

Adopting JP-5 as Single Fuel increases stay in theater by 20%

Property	F-76	JP-5	Difference
Specific Gravity	0.844	0.819	-3.0%
Density*	7.005 lb/gal	6.862 lb/gal	-2.0%
Energy content by weight	18,456 BTU/lb	18,356 BTU/lb	-0.54%
Energy content by volume	129,291 BTU/gal	125,965 BTU/gal	-2.6%



JP-5 as Single Fuel (I)

Facts:

Tankers store more cargo than CLF

Operational range

- Tankers = 6000nm
- CLF = 3000nm

Assumptions:

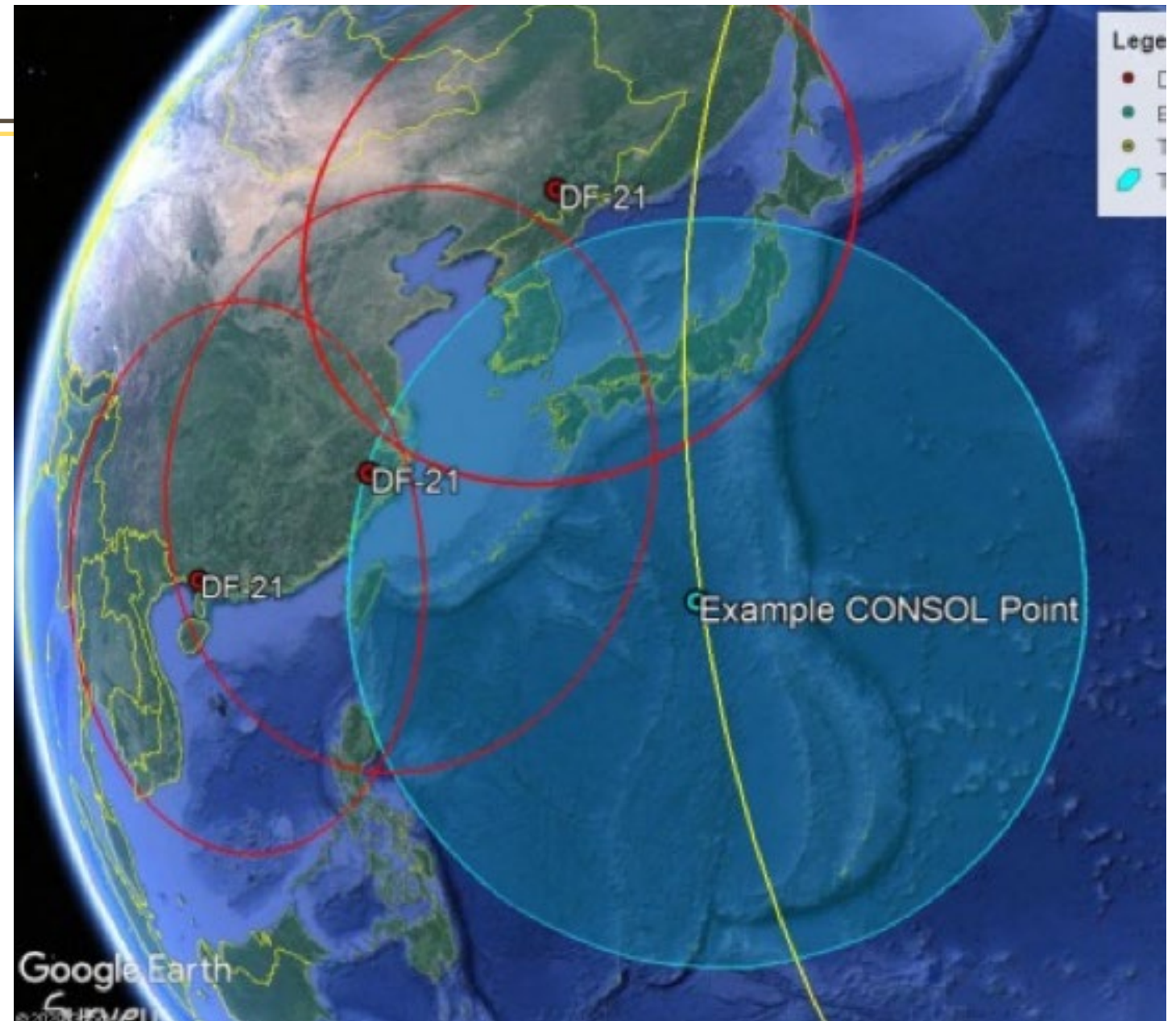
CONSOL = 3500nm from HI

Tankers delivers fuel to TAO

TAO delivers fuel inside first island chain

Capacity	T-AKE	T-AO	T-AOE
Dual fuel (bbls)	26.3k	173.4k	166.6k
Single fuel exp. (bbls)	5.3k	21.4k	17.1k
Expansion	20%	12%	10%

Source: Jimenez, Walters, Lessner (2020)





JP-5 as Single Fuel (II)

Carrier Strike Group (CSG) +
Amphibious Readiness Group (ARG)

- Souda Bay, Greece → Loch Striven, Scotland.

Multiple operations

- Flight Operations
- Pre-Assault
- Assault
- Sustain

Multiple energy contents

- JP-5 energy tested from 97% to 100% of F-76

Sample case	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

Source: Witt (2022)



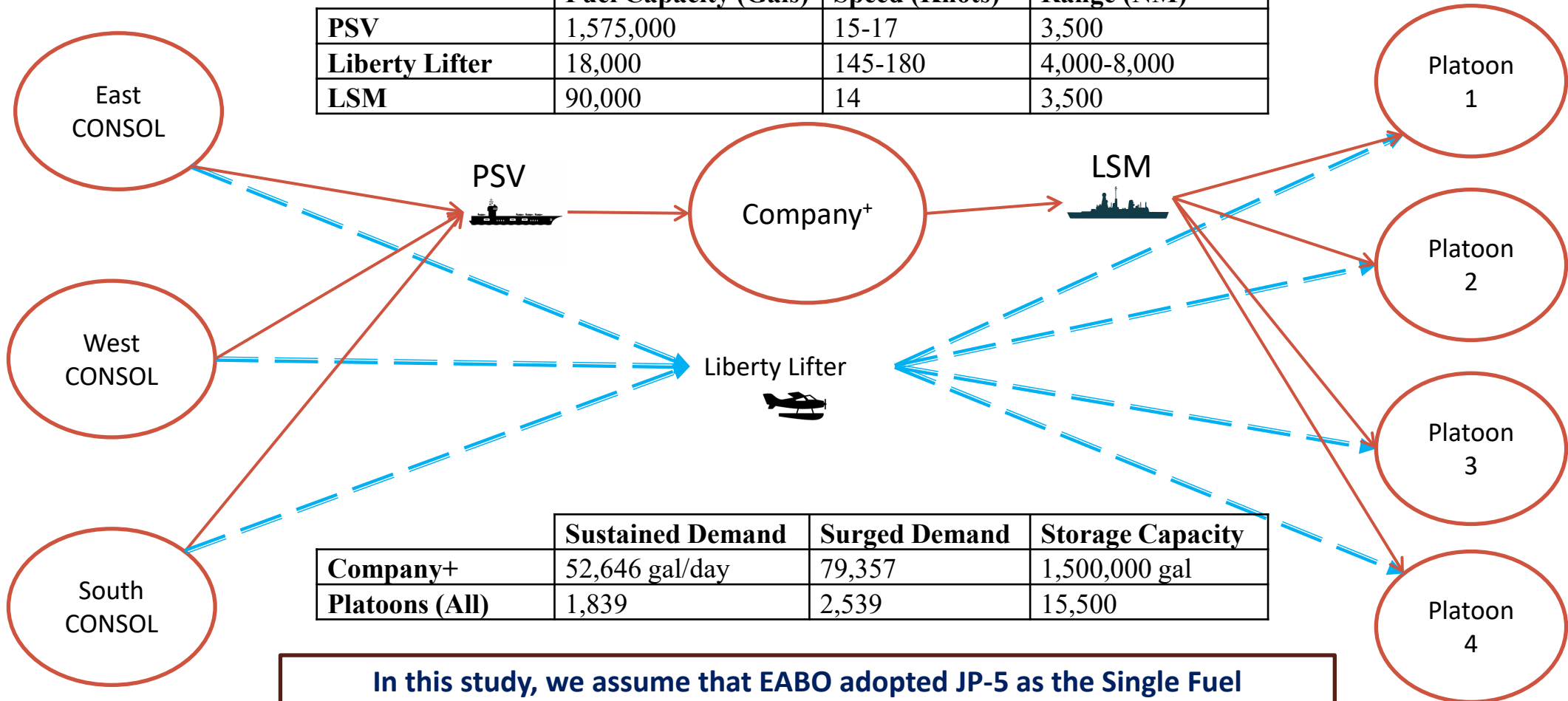


Notional Network Design

Resupply to the Company via Air & Sea

Resupply to Platoon via LSM

	Fuel Capacity (Gals)	Speed (Knots)	Range (NM)
PSV	1,575,000	15-17	3,500
Liberty Lifter	18,000	145-180	4,000-8,000
LSM	90,000	14	3,500

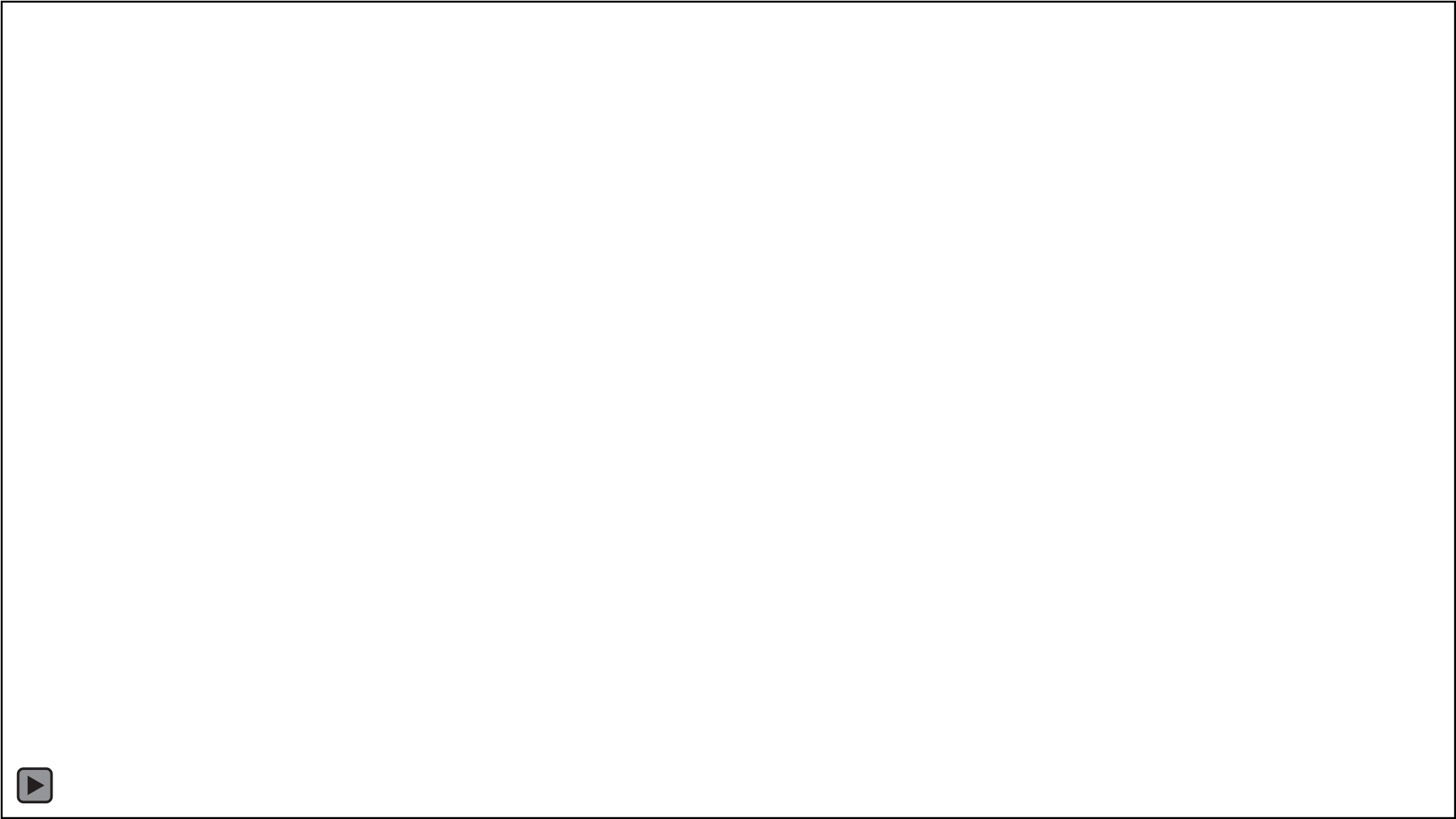


	Sustained Demand	Surged Demand	Storage Capacity
Company+	52,646 gal/day	79,357	1,500,000 gal
Platoons (All)	1,839	2,539	15,500

In this study, we assume that EABO adopted JP-5 as the Single Fuel

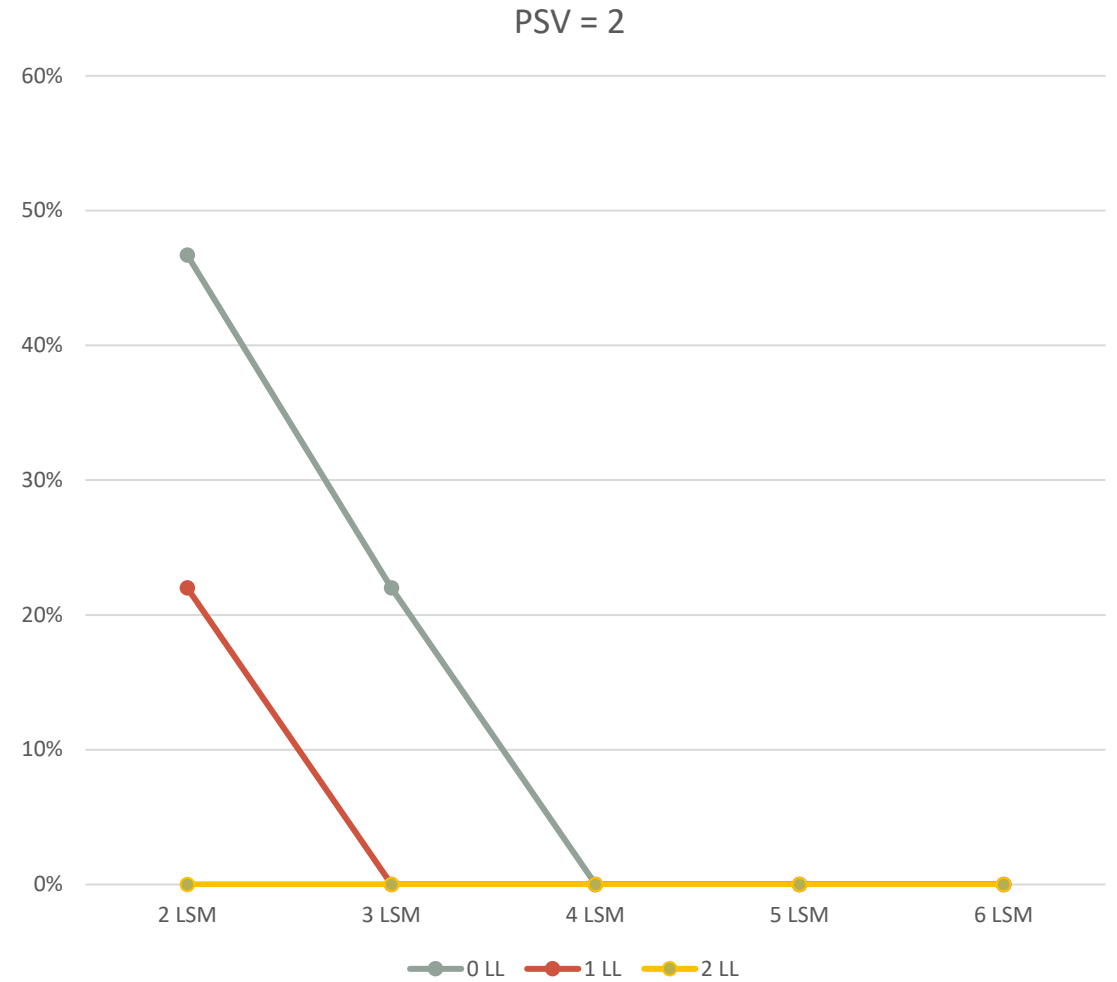
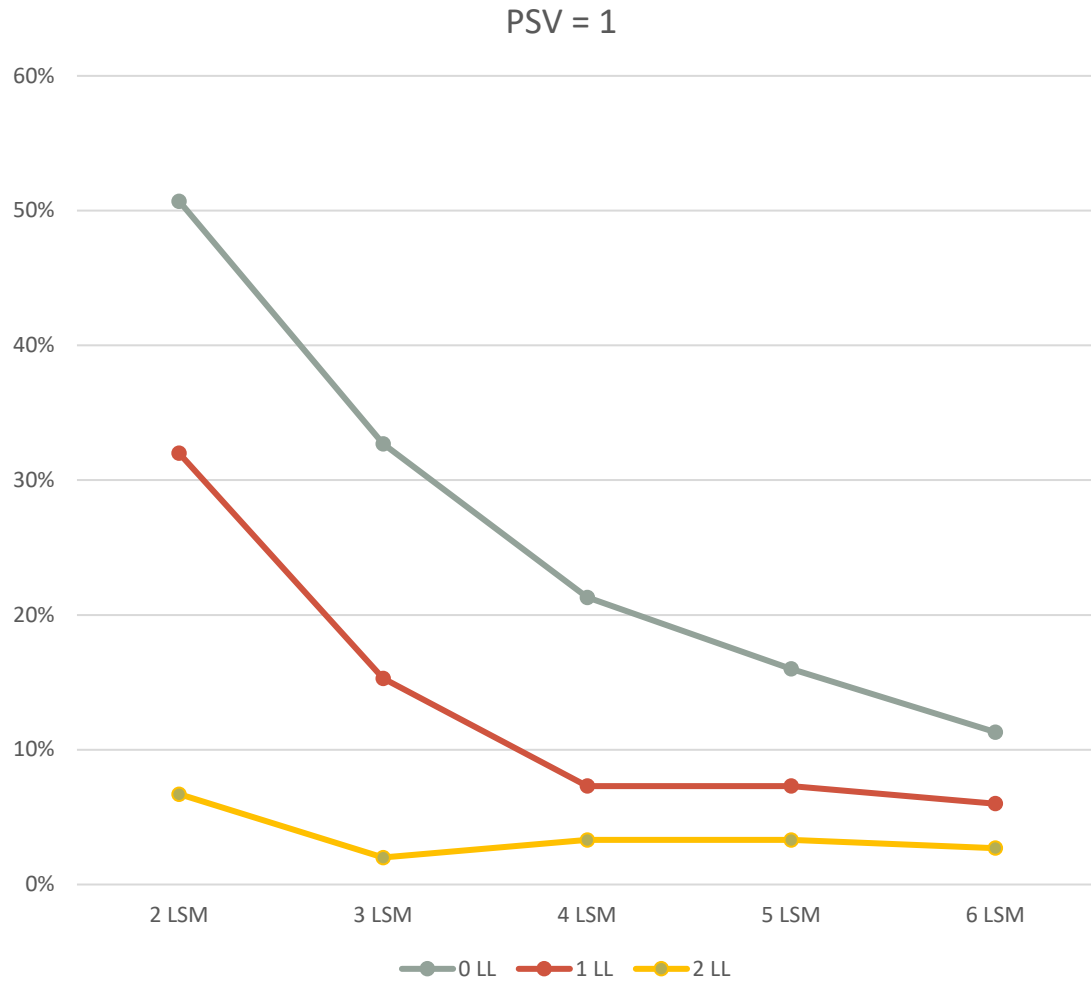


Notional Resupply Network Design



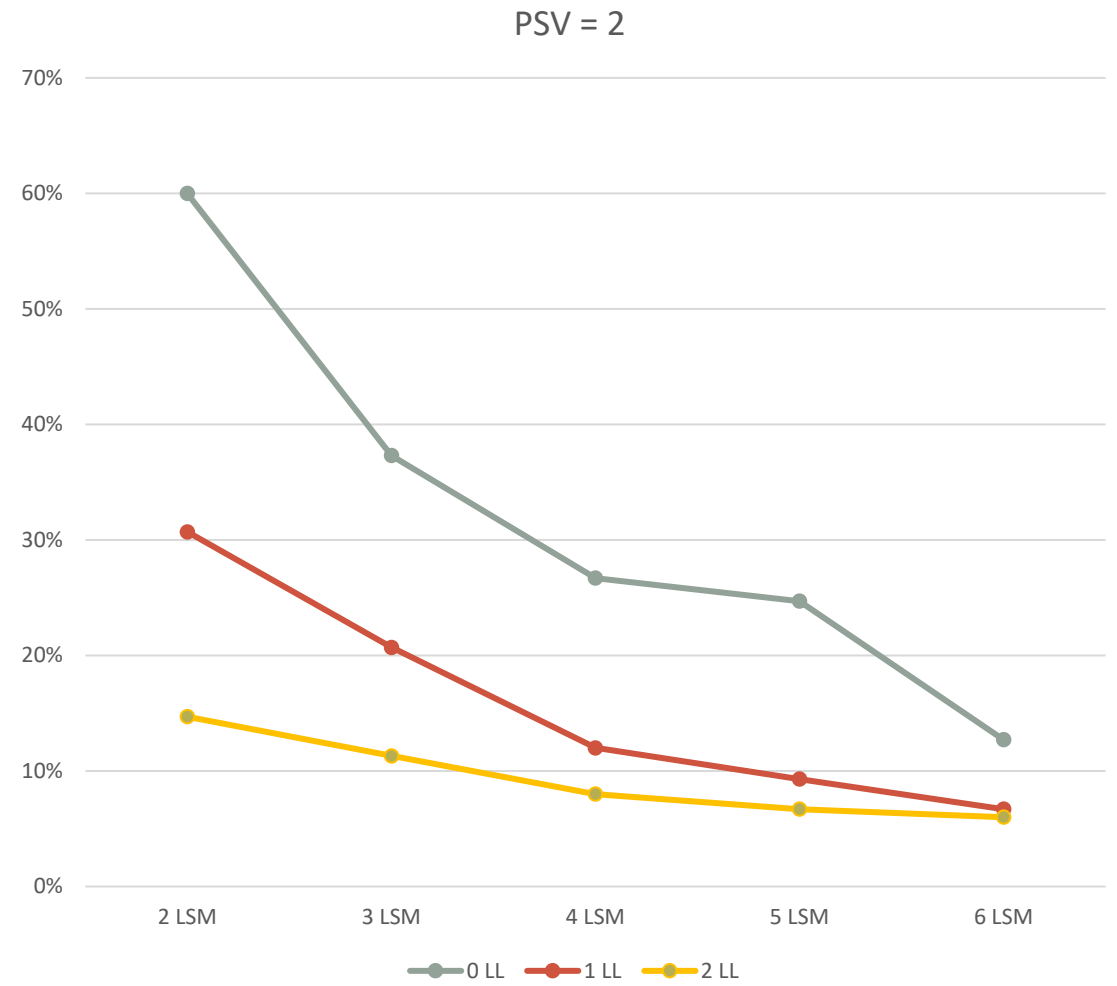
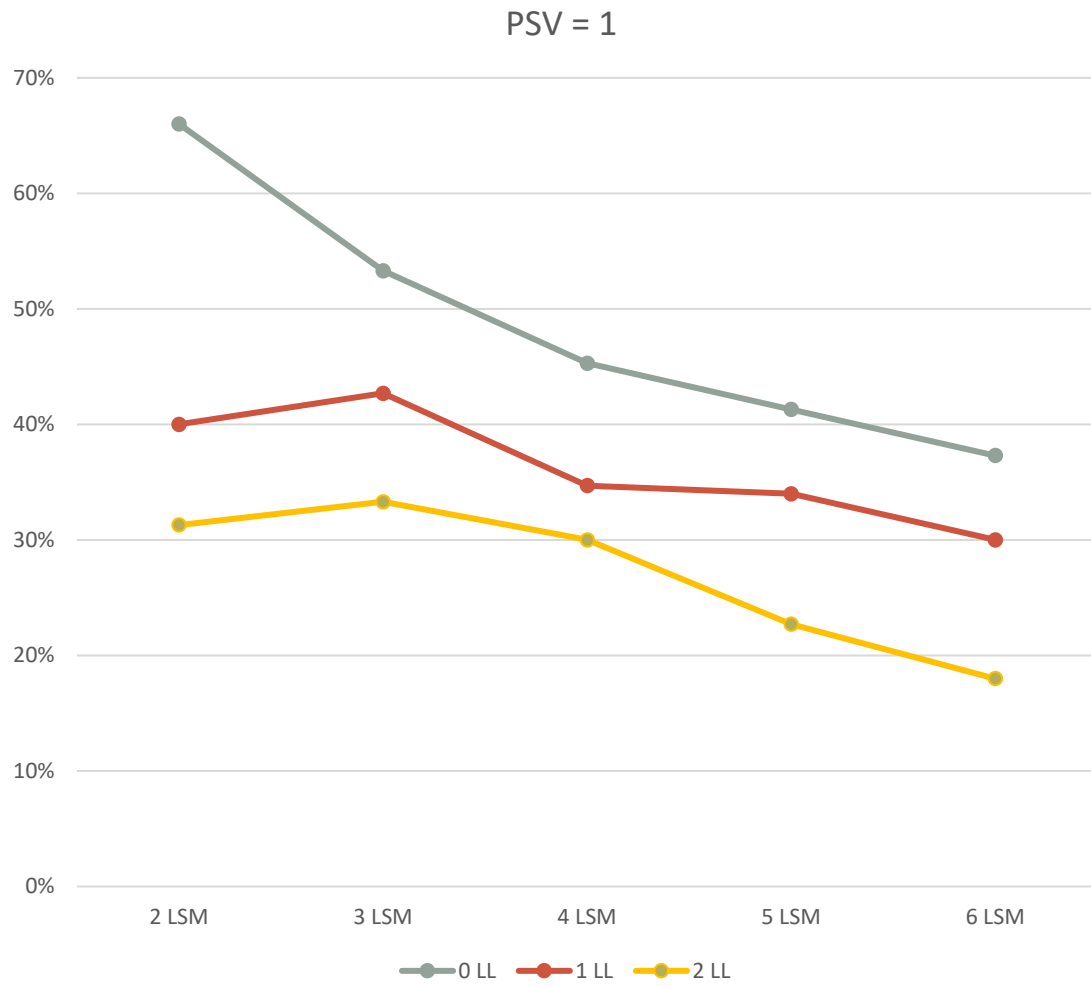


Sustained Demand Average Late Deliveries East CONSOL



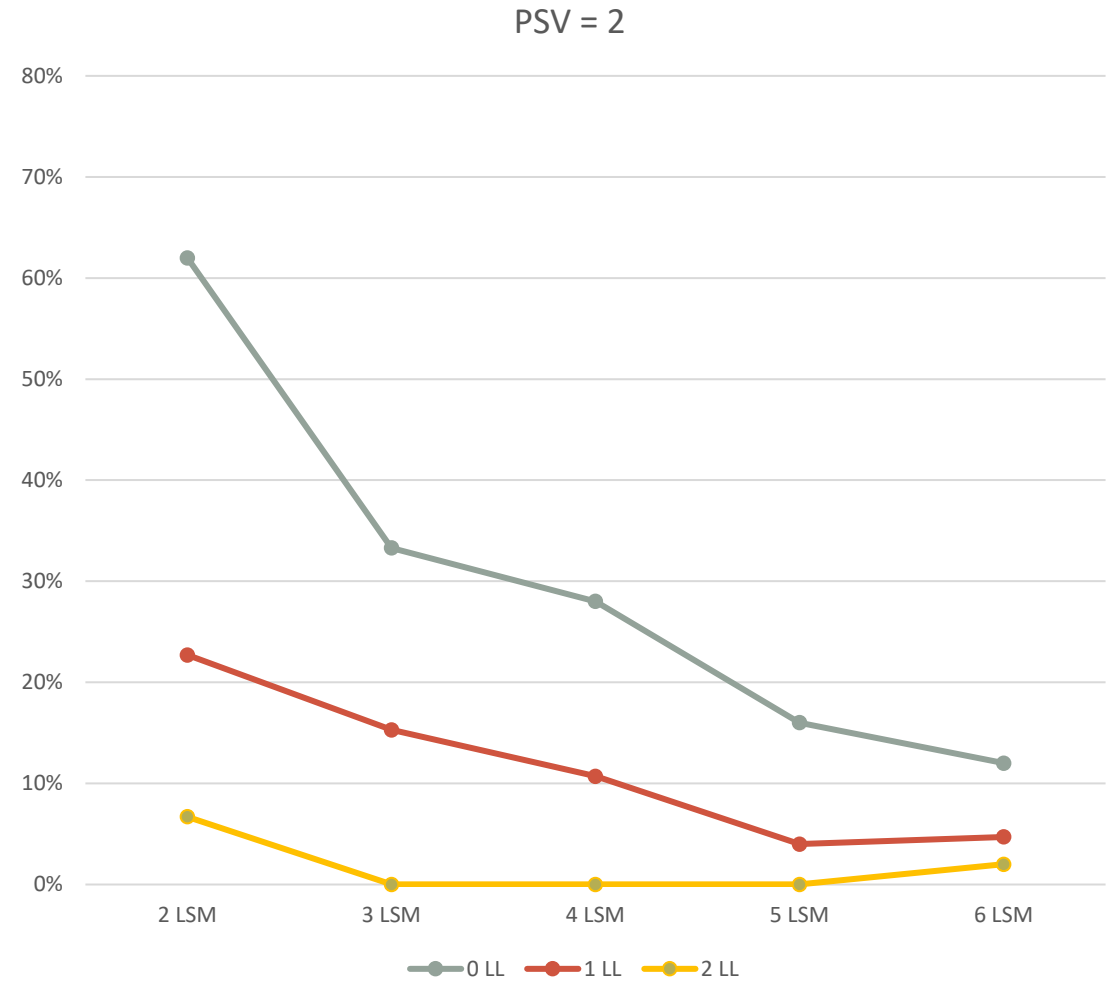
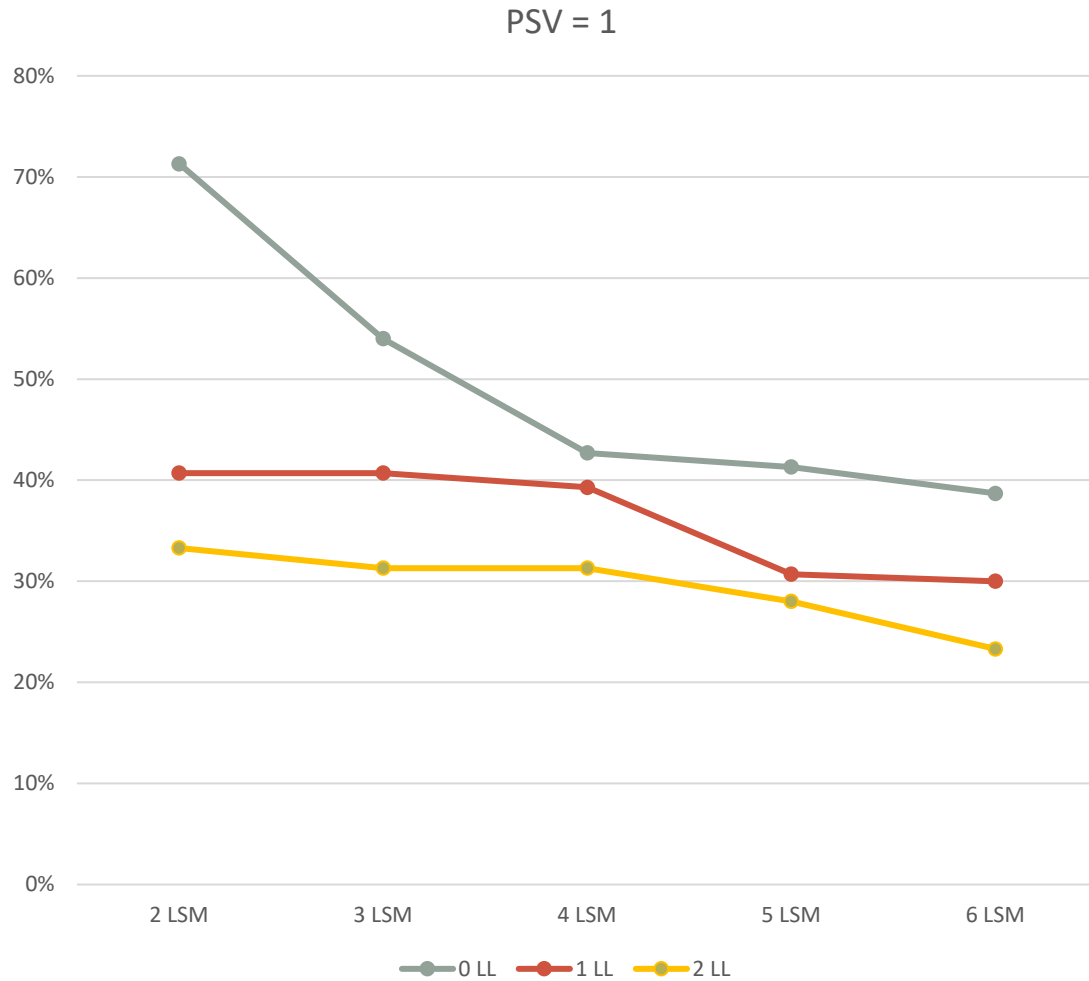


Surge Demand Average Late Deliveries East CONSOL





Surge Demand Average Late Deliveries East CONSOL w/ prepositioned assets





Questions?

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