Next Generation Logistics Ships: Ammunition and Supply

Abstract

The purpose of the project is to conduct unbiased research to determine the type and quantities of naval logistics platforms to meet the future requirements of intra-theater survivable logistics. In recent decades the United States Navy has proceeded unfettered by conventional threats or serious rivalry from near-peer competitors. Guidance from both the Chief of Naval Operations (CNO) and Commandant of the Marine Corps (CMC) have driven the Department of Defense (DoD) to pursue Great Power Competition and to recalculate the advantages and disadvantages our military force has over our adversaries. This increase in demand for innovation and capability advantage supplied new concepts such as distributed maritime operations (DMO), Littoral Operations in Contested Environments (LOCE), and Expeditionary Advanced Base Operations (EABO). These concepts changed how the U.S. Navy would employ and distribute its forces across the contested landscape. The U.S. Navy's N4 asked a complex question – how can the Navy logistically support and sustain these distributed forces without unnecessarily risking Combat Logistics Fleet (CLF) ships vital to the long-term sustainment of the fleet?



Naval

School

Postgraduate

Scenario Battlespace/Force Laydown



Results

- Our model provides the planner or decision maker the flexibility to
- The binding time constraint for Primary Supply Vessel (PSV) engaging with Surface Action Group (SAG) in Weapon Engagement Zone (WEZ) should be

determine whether 10 deliveries are made by 10 vessels or 5 vessels making 2 trips.

Ammunition and Supplied in Pallets	Supply/Demand
A-S Supply at CLF 1	100000
A-S Supply at Trans 3	750
A-S Demand at SAG 2	100
A-S Demand at Trans 3	750
A-S Demand at ASuW 4	50
A-S Demand at FARP 5	350
A-S Demand at LOG 6	350
Ammunition and Supplied in Pallets	Capacity
PSV from CLF 1 to SAG 2	60
PSV from CLF 1 to Trans 3	800
PSV from Trans 3 to ASuW 4	800
PSV from Trans 3 to FARP 5	800
PSV from Trans 3 to LOG 6	800
FSV from CLF 1 to SAG 2	60
FSV from CLF 1 to Trans 3	250
FSV from Trans 3 to ASuW 4	250
FSV from Trans 3 to FARP 5	250
FSV from Trans 3 to LOG 6	250
LAW from CLF 1 to SAG 2	60
LAW from CLF 1 to Trans 3	1000
LAW from Trans 3 to ASuW 4	1000
LAW from Trans 3 to FARP 5	1000
LAW from Trans 3 to LOG 6	1000

Supply, Demand, and Capacities: Ammunition and Supplies.

Ammunition and Supplies	Deliveries
PSV from CLF 1 to DDG 2-1	1
PSV from CLF 1 to DDG 2-2	1
PSV from CLF 1 to DDG 2-3	1
PSV from CLF 1 to LCS 2-4	1
PSV from CLF 1 to Trans 3	1
FSV from Trans 3 to ASuW 4	1
FSV from Trans 3 to FARP 5	0
FSV from Trans 3 to LOG 6	0
LAW from Trans 3 to ASuW 4	0
LAW from Trans 3 to FARP 5	1
LAW from Trans 3 to LOG 6	1
Total	8

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Number of Deliveries with LCS

investigated.

Based on our analysis and scenario, the acquisition of the Light Amphibious Warship (LAW) is favored over the Fast Supply Vessel (FSV).

Deliveries	Scenarios	Combined	Split 1	Split 2
1				
	Ammunition and Supplies in Pallets	Deliveries	Deliveries	Deliveries
1	PSV from CLF 1 to SAG 2	2	2	
1		_	_	
1	PSV from CLF 1 to Trans 3	1	1	
1	FSV from Trans 3 to ASuW 4	1		0
1				
0	FSV from Trans 3 to FARP 5	0		0
0	FSV from Trans 3 to LOG 6	0		0
0	LAW from Trans 3 to ASuW 4	0		1
1				
	LAW from Trans 3 to FARP 5	1		1
1	LAW from Trans 3 to LOG 6	1		1
1		_		_
8	Total	6	3	3

Scenarios: Split Network

Number of Deliveries with FFG

Ammunition and Supplies

PSV from CLF 1 to DDG 2-1

PSV from CLF 1 to DDG 2-2

PSV from CLF 1 to DDG 2-3

PSV from CLF 1 to FFG 2-4

PSV from CLF 1 to Trans 3

FSV from Trans 3 to ASuW 4

FSV from Trans 3 to FARP 5

FSV from Trans 3 to LOG 6

LAW from Trans 3 to ASuW 4

LAW from Trans 3 to FARP 5

LAW from Trans 3 to LOG 6

Total

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