

The Changing Character of Warfare

Adapt or Perish

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The Key Rule of Military History

Leave Mountain People Alone

Purpose

- What emergent capabilities are driving changes in character of warfare?
- What impact will these changes have on the various domains of warfare?
- Operational and strategic implications
- Some questions to consider

Underlying
NATURE OF WAR
does not change,

CHARACTER OF
WARFARE
changes continually

Emergent Capabilities

- Pervasive surveillance
- Precise mass
 - Extended range
 - Emerging autonomy
- C4ISR that can exploit both
- Multidomain is norm

**Both sides are able to practically hit
'everything, everywhere all at once'**

The Hague Center Feb 2026

Pervasive Surveillance

All weather, all the time

- Space based
 - Visual/IR (10 cm) , SAR, ESM, Radar – many times per day – 10 cm
 - 100,000 small sats by 2030
- Ground based – all spectrum
- Drones – minutes to weeks

**If you produce a signature,
You will be seen.**

Precision Mass

Artillery, rockets, missiles, drones

If you are seen, you can be hit



- Harop – loitering munition
 - 600 Miles – 50 lbs
- VTOL
- Autonomous – Visual, IR, EMS
- Operational in over 10 nations



- British RCH 155 mm
- Range: 54 km
- Shoot on the move
- Uncrewed turret; 8 RPM



- C-130 w/ Dragon Cart
 - JASSM-ER – 600 miles
 - Longer range missiles available
- Allied use too

First Person View



- Homemade
- RPG Warhead
- 10 km
- \$500-1000

- Fiber-Optic Guidance
 - Loitering Munitions
 - 15 – 50 kms
 - Semi-autonomous
 - \$900 -??



11,000 Homemade FPVs = 1 M1

Minelaying Device for Drones



Ukraine



Impact of Drones

- Ukraine – Russian vehicles destroyed
 - Early 2024 – 90% vehicle kills
 - Early 2026 – 95% of personnel kills
 - Operational logistics – 200 km
- Long-range strike – out to 2000 km
 - Russian Gasoline shortage
 - Russian AF retreated
- Tactical no go zone is 30-40 km deep
 - US Tube artillery outranged

Countering UAVs

● Direct Fire

- Advantages
 - Speed
 - Accuracy
- Disadvantages
 - Range
 - Magazine Capacity

● Directed energy

- Advantage to land based
 - Power
 - Concealment
 - Cheap per shot
- Disadvantages
 - Environment, burn thru time
 - Power/distance contest

Countering UAVs



- Sting VTOL
- \$2500
- VTOL
- Autonomous
- March 2026 – 33,000 kills

- Mobile fire units
- Reservists/part time
 - Radar assisted
 - AI positioning



Ukraine Long-Range Strike



Ust-Luga Russia

Sea Baby to Magura 7

- 2022
- 400 NM
- 240 KG



- 800 NM
- 650 KG
- SAMs, guns, drones, mines, rockets
- \$700,000
- 42 knots



UxVs vs Black Fleet

- 1 Cruiser
- 5 Frigates
- 9 Large landing ships
- 2 submarines
- 14 Minesweepers
- Numerous small landing ships
- Damaged three oil tankers
 - Med and Atlantic



Autonomous Underwater Vehicles



Norwegian HUGIN

- Autonomous
- Surveillance
- 1,000 NM
- 0.04% Nav accuracy

Anduril Ghost Shark

- Autonomous
- Fits in FEU
- Multiple payloads
- All electric
- 1,000 mi/2025



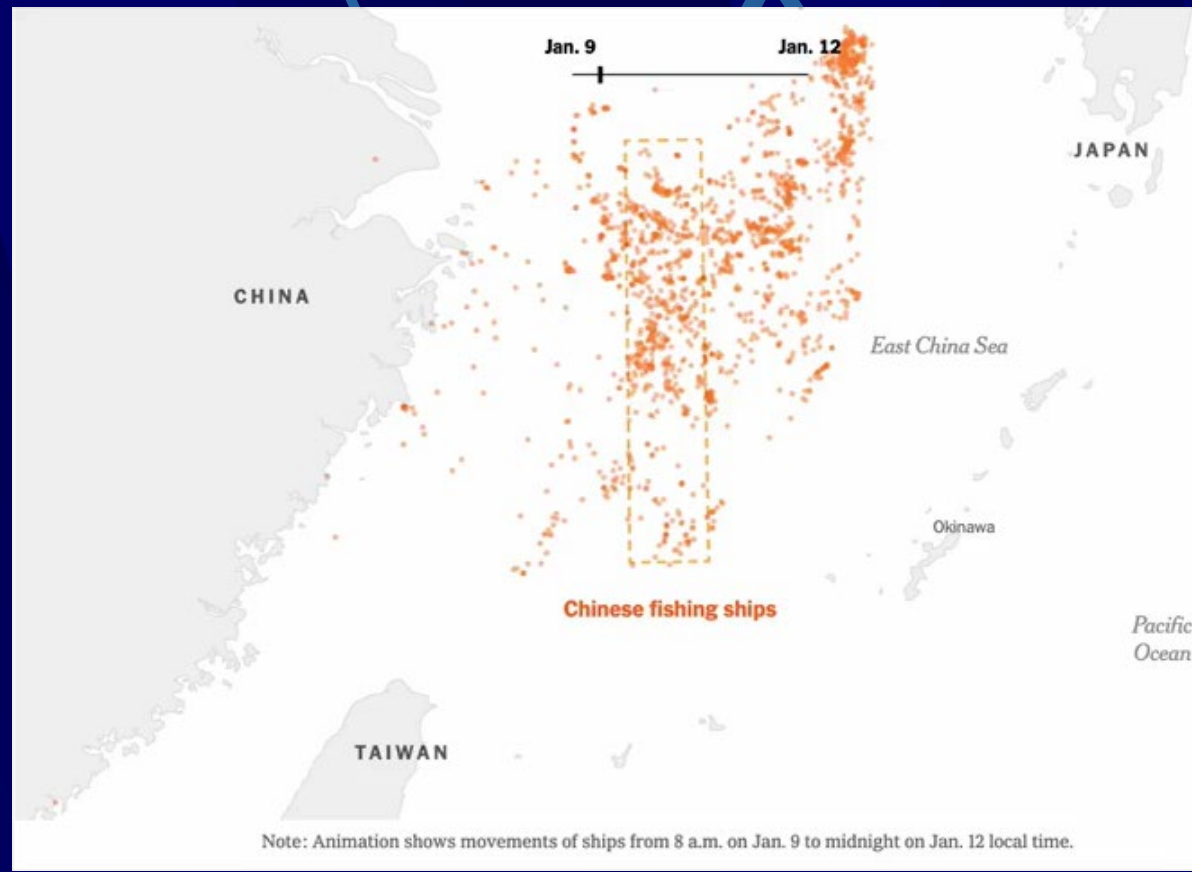
Anduril Copperhead

- MK 48 ADCAPs
- MK 54



200 sharks/year; 1,000s of Copperheads

Chinese Fishing Fleet Barrier Formation



Containerized Systems

Hide in plain site



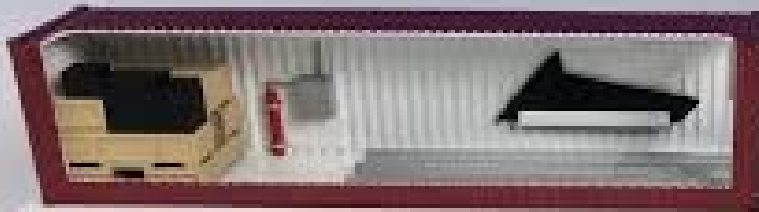
Russian Club-K



Iranian test



Estonian ASCM



Valkyrie

C4I: **Exploit advances**

C4I - Ukraine

Demonstrated capability

- Delta – decision support/sit awareness
 - Runs on any platform
 - Routed through Starlink
 - AI assisted – Palantir
 - Inputs from sats, radars, sensors, phones
- Unit to national communications package

C4I – Gaza/Iran

- Israel
 - Lavender – 37,000 people
 - The Gospel – 20,000 buildings
 - Where's daddy – active tracking
- United States
 - Maven Smart Suite
 - Anthropic

Tactical Impacts

Irregular War



Conventional Warfare

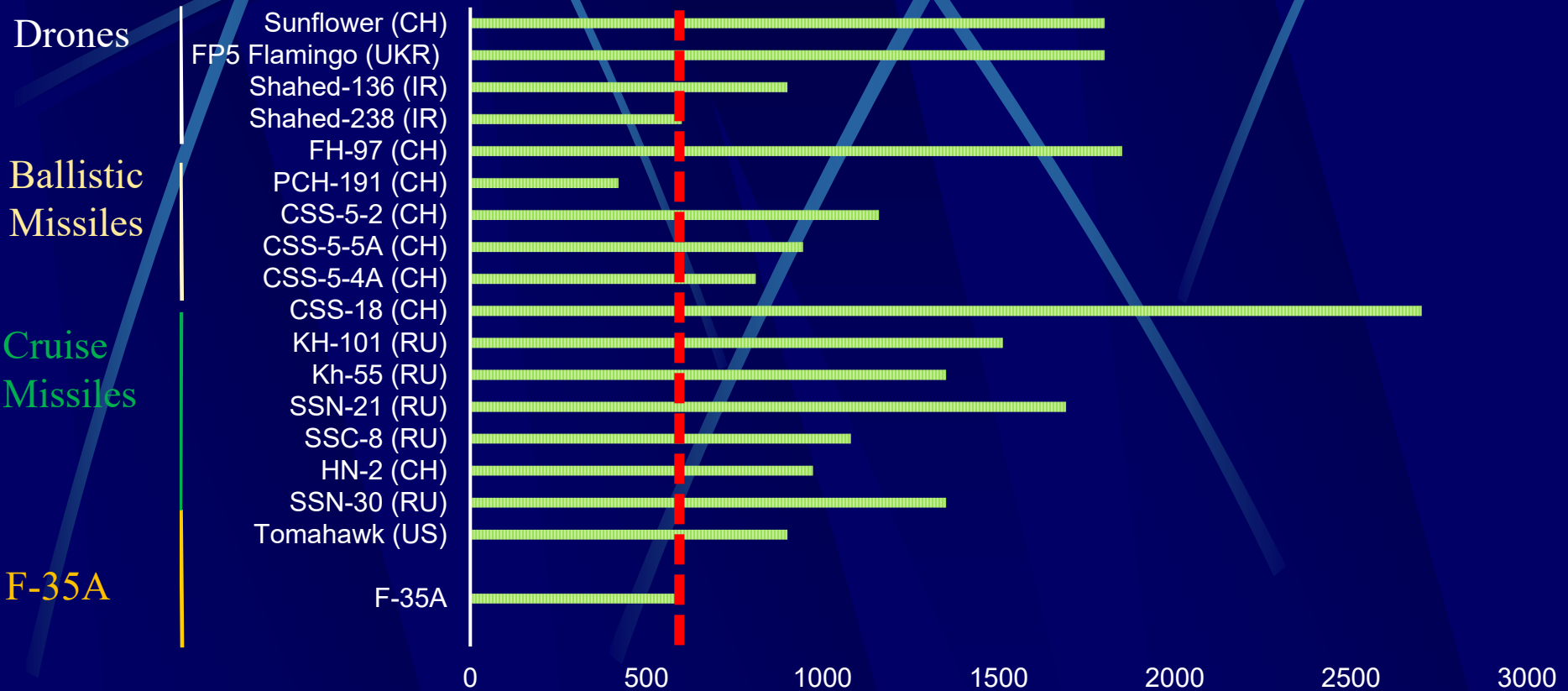
- Connected C2 critical
 - Must prepare to fight disconnected
- Defense dominates air, land domains
- Sea domain is mixed
- Space and electromagnetic contested
- Cyber uncertain
- Power projection much more costly

Legacy vs Emerging Systems

- Outranged
- Outnumbered
- Fragile
- Unsupportable
- Unaffordable
- Unreplaceable

Air Domain Numbers and Range

Operational Range in Nautical Miles



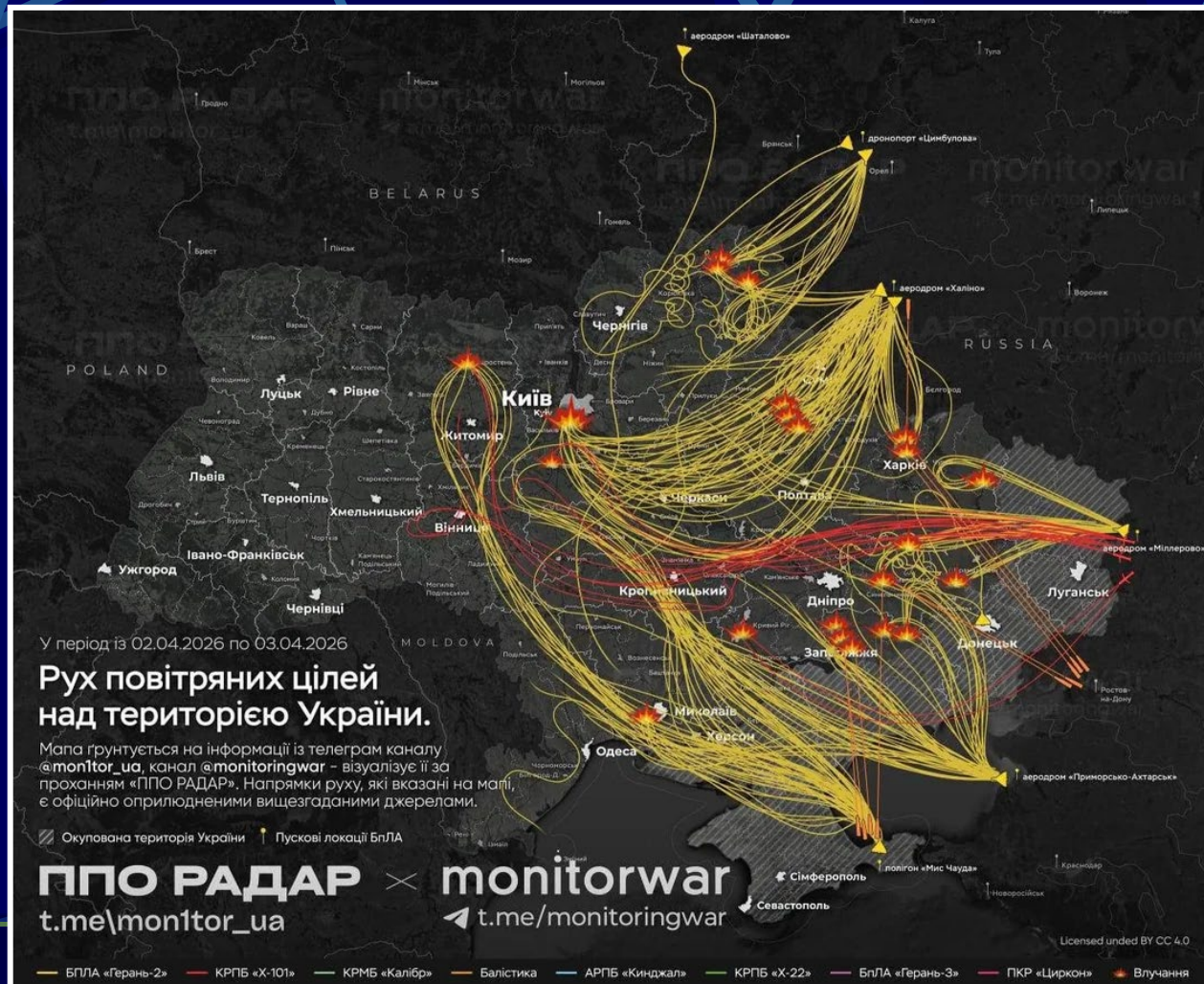
Are manned aircraft range obsolete?

Bases Vulnerabilities

- Stimson paper 7-30 days
 - Partial PLARF
 - No PLAA, PLAN, PLAAF participation
- CONUS bombers/tankers vulnerable
- Ports can be mined or struck
- Massive signatures of C2 and logistics
 - Most fixed and unprotected

Russian Drone/Missiles

April 3, 2026



China



- Sunflower 200
- 2,000 km
- 50 kg
- Mass produced



- TM-300
- Stealth
- Mach 1.8
- 1,200 km, 100 kg
- Mass produced

Land Domain

- Defense Dominant
 - Attacker must move and converge
- Cheap drones range – 30 – 100 km
 - Over 10 million in Ukraine in 2026
 - Increasing autonomy
- Russian ground force losses
 - Tanks – 11,000; APCs – 23,000; Arty – 33,000
 - Personnel – 1.3 million
- Armor/tube artillery outranged

Impact of Drones & Cheap Missiles

- Drones
 - Early 2024 – 90% of vehicle kills
 - 2025 – UKR 819,737 confirmed hits
 - March 2026 – 35,000 KIA/WIA, 96% drones
 - Cumulative Russian losses –
 - 65,000 tanks, IFVs, Arty
 - 1.2 Million casualties
- Missiles
 - 50% reduction in oil exports
 - 400,000 bpd less production
 - Air Force withdrawn deeper into Russia

Sea Domain

USN is Fragile

- Any ship can kill any other ship
- Think weapons not platforms
 - Missiles, drones, mines, torpedoes
 - Tens of thousands not dozens
- Land based defense dominates sea to increasing ranges
 - Comms, cover, & magazine advantages
 - Choke points closed – land-based blockade
- Small states/insurgents challenge navies

Fragility - Carriers



USS Oriskany – 1966
5 months



USS Enterprise -1966
51 days



USS Forrestal – 1967
9 months

Fragility – Surface Line

Average 1.2 Cruise missiles to sink or disable



HMS Coventry



USS Stark

Unsupportable

- Very low readiness rates < 50% for many
- Complexity of weapons
- Limited suppliers
- Massive logistics backlog
- Forward logistics facilities in range

Peacetime with large bases

Unaffordable

- F-35A = \$855M each lifetime
 - \$2.1B to insure one works
 - Lockheed was delivering w/out TR-3 or Block 4
 - Next gen will cost 3 times as much
- CV = Purchase > \$20 B with airwing
- = Lifetime – approaching \$100B
- Missiles = LRASM/JASSM-ER - \$3.3M; PAC-3 Interceptor - \$3.4M

Unreplaceable

- F-35: 13 per month (20 users)
- B-21: 7 per year
- CV: 9 years each (JFK delayed)
- DDGs: 2/year; FFG: ??
- SSNs: 1.5/year
- Munitions: Iran war has consumed years of production

**Money won't fix it –
DIB can't produce mass**

The Good News

- New weapons
 - Range
 - Mass producible in wartime
 - Affordable
 - Supportable

Collaborative Combat Aircraft



XQ-58A Valkyrie

- 5,000 KM – 270 KG
- 4,000 KM – 540 KG
- Autonomous/VTOL
- \$3M
- Mass produced

- YQF-42A and 44A
- 1,200 KM
- Semi-autonomous
- \$25-30M



700 Valkyrie = 1 F-35A Lifetime cost

FML-136 LUCAS

Low-cost Unmanned System

- Linked, swarming
- Autonomous
- NLOS control if needed
- 700 km, 18 kg warhead
- \$35,000
- 3 months to reverse engineer Shahed
- TF Scorpion Strike in CENTCOM



Autonomous Attack Drones

- Over 100,000 delivered in 2025
- Bumblebee – 15-30 km range
 - Lock on from 1.6 km
 - 70% hit rate – 1,000 live missions
- Hornet – 120 km range
 - 5 kg payload
 - 6,000 per month initial plan
- Vermeer – 90 km
 - Guidance – .5 kg

Cheap Long-range Precision Platform Agnostic - autonomous



- VTOL
- Swarming
- Commercial parts
- 2026 – 100/month

Anduril Barracuda

- 100** – 220 km, Helicopter, fighter, container
- 250** – 370 km, Fighter, cargo, container - \$160K
- 500** – 900 km, Fighter, cargo, container -\$220K

15 Barracuda 500s for 1 LRASM

Autonomous Surface Vessels



- USN MUSV
- 8 containers
- 20-66 Barracuda each
- Autonomous/swarming

- Blue Water Autonomy
- 5 shipyards
- Container capable



- Saronic Corsair
- 1000 km
- 450 kg
- 35 knots



Missile Merchants



- **\$25 million for ship**
- **Total - \$125M**
 - **40-250 missiles**
 - **VTOL Drones**
- **Small crew**
- **Well-armored**

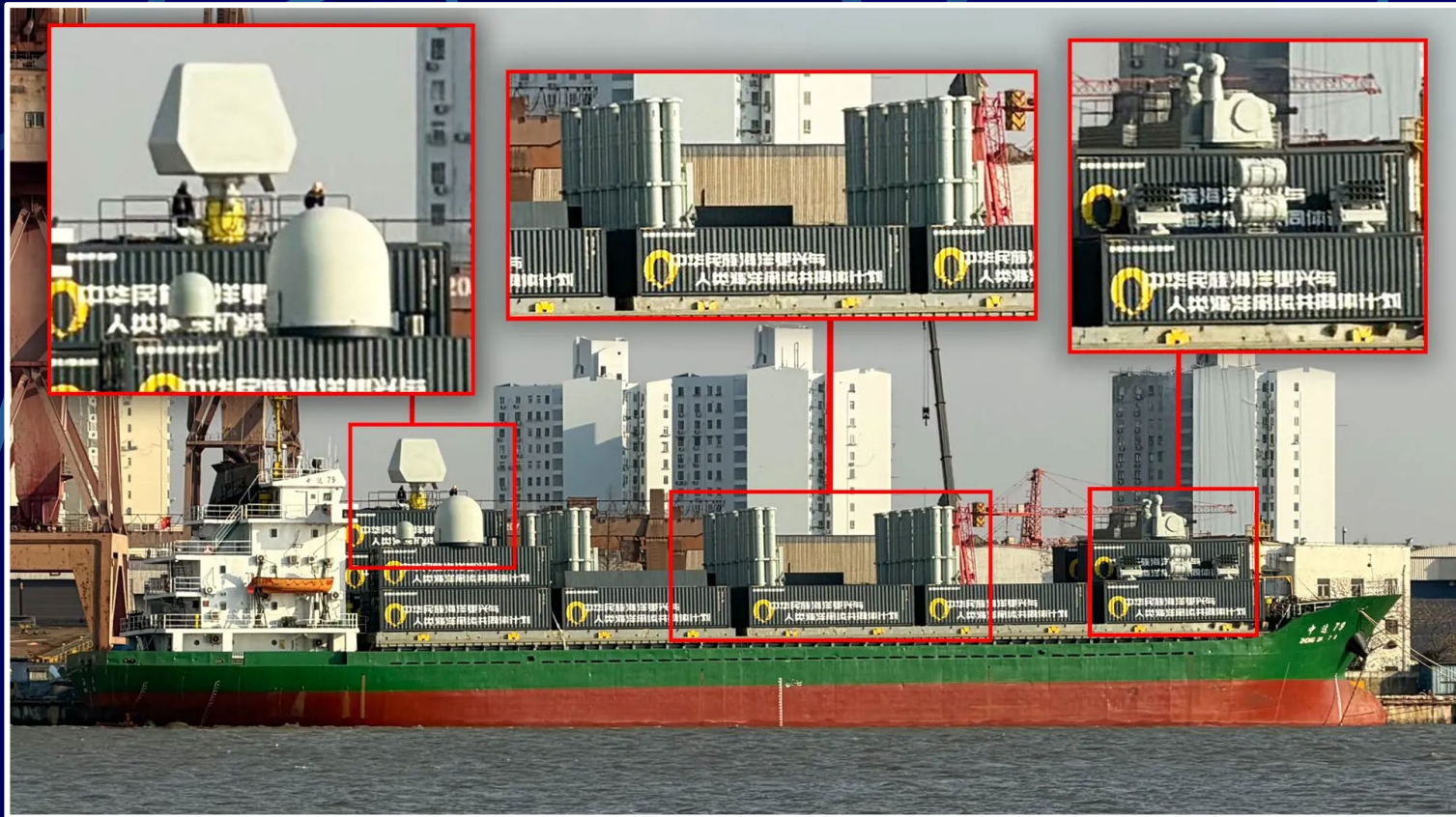


- **\$2-5 million for ship**
- **4 – 20 LR missiles per TEU**
- **66 SR missiles per TEU**
- **VTOL Drones**

8 Large MM w/320 to 2000 missiles = 1 *Constellation* class

PLAN

25 Dec 2025



- Phased array radar
- 60 VLS cells
- 2 CIWS
- 2 Decoy launchers

Initial analysis

- Weapons NOT platforms - High-low mix
- Current platforms
 - Reduce/slow/stop buys
 - Invest in readiness for current systems
- Current weapons
 - Continue buys but examine replacements
- Accelerate weapons/systems for emerging missile age

Some Questions

- Should operating concepts focus on defense?
- Payloads not platforms?
- Containerize everything?
- Production for long wars?
- Battlespace management?

The entire history the Marine Corps summed up



I was extremely drunk that day.



Contact Information

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