Surface Fleet Disaggregation; Sense, Decide and Effect
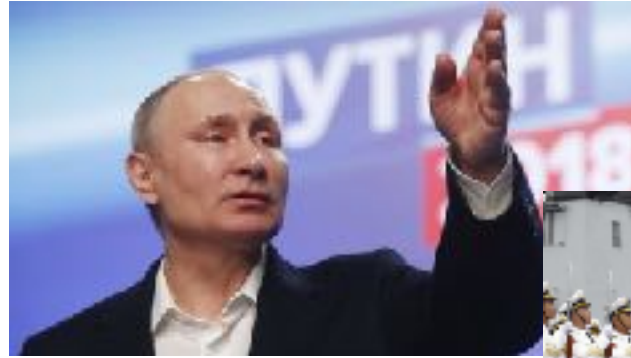
Andy Mitchell

Deputy Director – Navy Capability Sponsor

Combined Naval Event – 22nd May 2024

What the future Security environment means to the maritime domain

- **State level competition**

- **Technology proliferation**

- **Affordability**

- **Climate Change**

- **Demographic change**

Navy Develop's Purpose

Collaborate with partners to design the right Navy to meet defence and naval policies and strategies, and launch the right change projects to deliver that Design.

Navy Command Operating Model

DIRECT.

DEVELOP. ACQUIRE GENERATE OPERATE

FUNCTIONS.
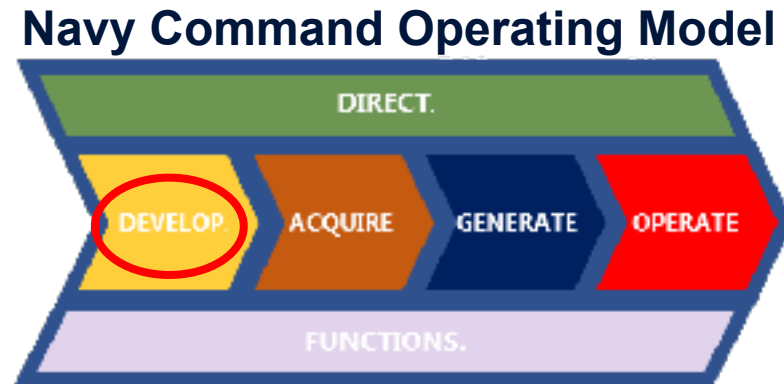
MarOpC – The implications of becoming a protean Navy, and taking a systems of systems approach – disaggregation of sense / decide / effect, and the requirement for StrikeNet

Move away from Directional Command

Self-healing integrated network of hosts each with decide abilities
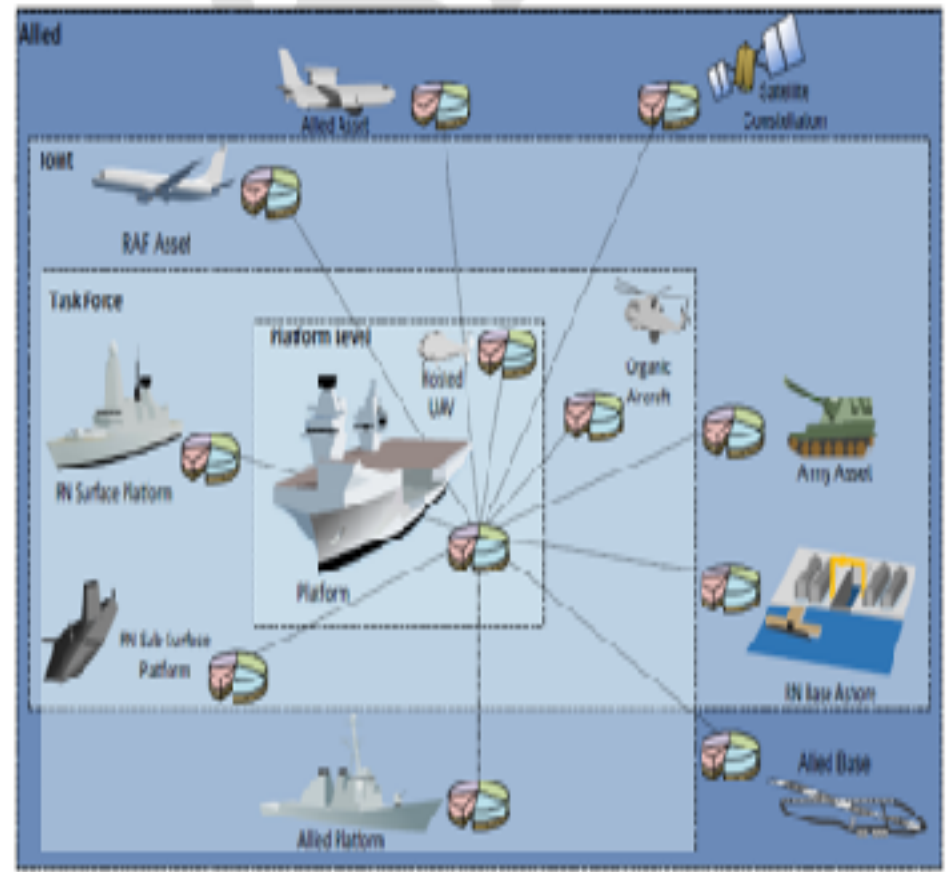
Standardising how we describe Capabilities - the Capability Model

A capability model that will enable us to standardise the description of 90%+ of the Defence's capabilities.

It's a model though, so won't be perfect or able to fully describe all we do.
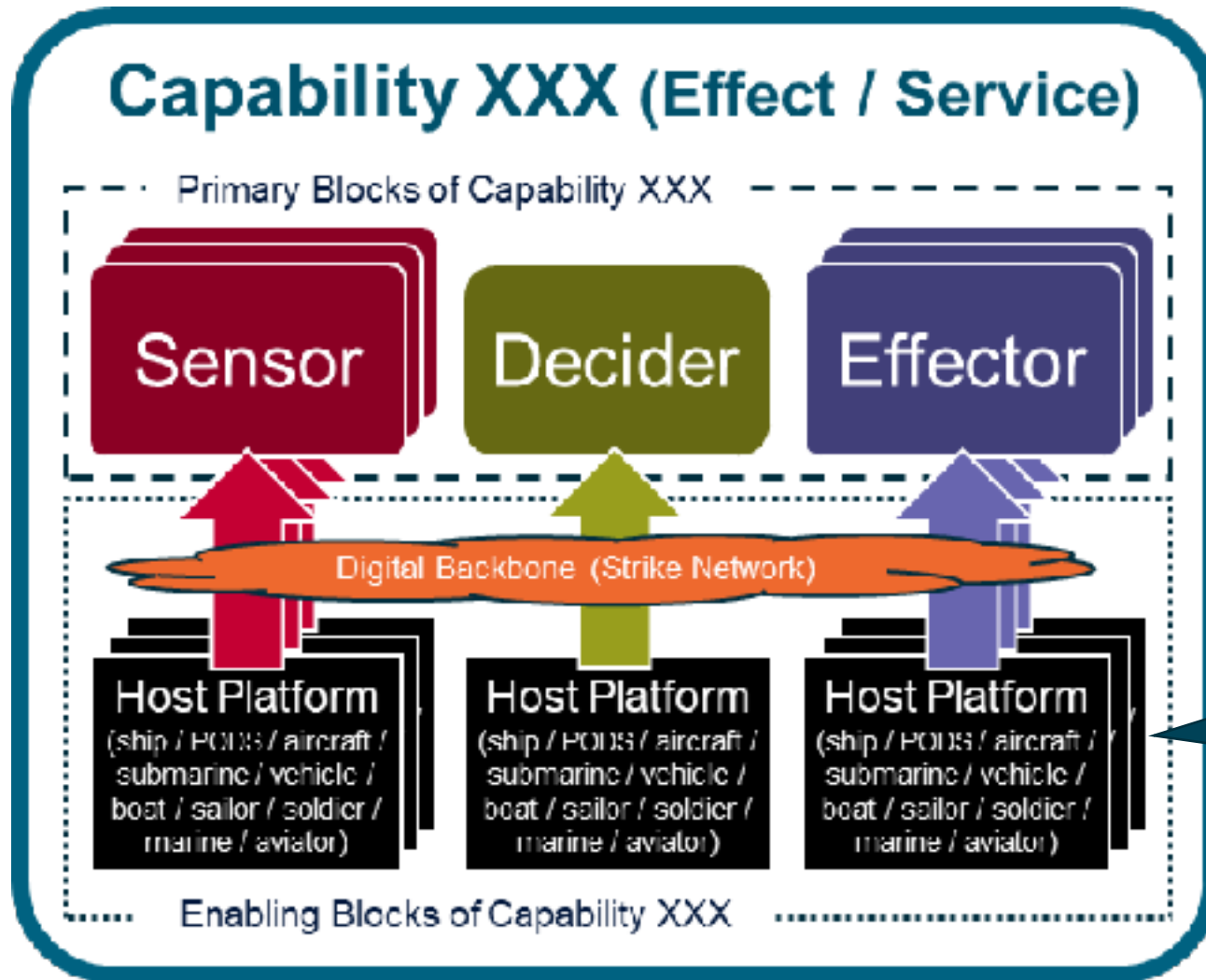
The capability may be fully hosted on one platform, or have its blocks spread across multiple platforms

Navy Systems of Systems Approach

Using SOSA to design and procure the future Navy, based around the capabilities we need;
• Surface Strike, Air Defence, Anti Submarine Warfare, Indirect Fires, Logistics Resupply, Theatre Entry, Mine Warfare, Cyber Offense, Land Strike, etc
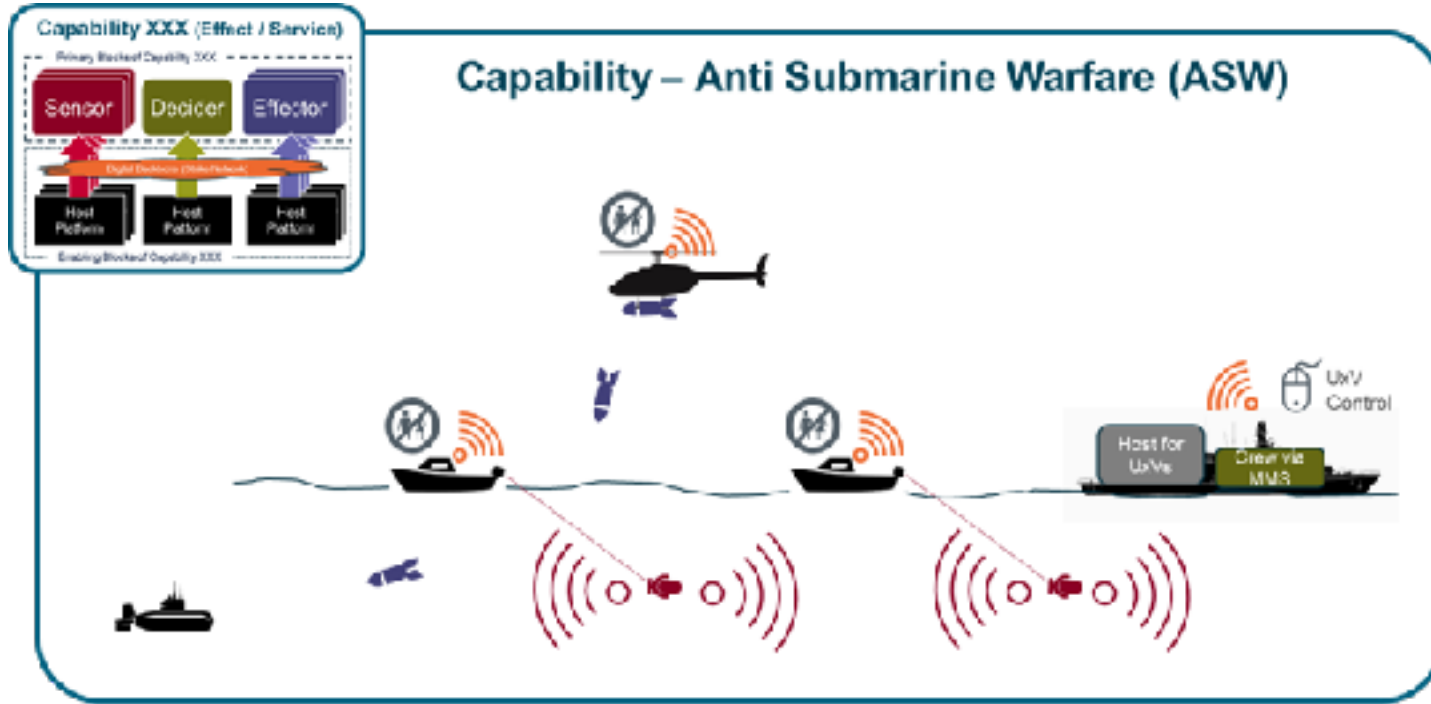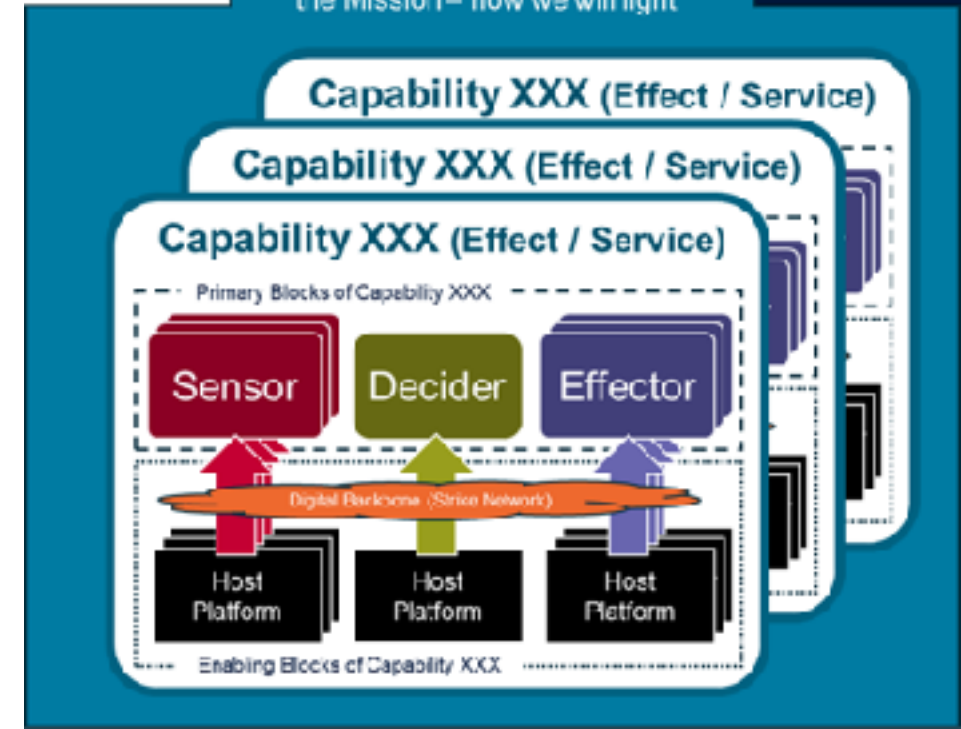
We're changing from platform primacy to capability primacy

Taking a systems of systems approach (SOSA)

Ministry of Defence

Defence Capability Hierarchy (Example 1)

Defence's Purpose – Protect the Nation & help it prosper

L-2 Defence Outcome — Homeland & Overseas Territories are Protected — Euro Atlantic is Secure

L-1 Defence Campaign — To Deter Russia

L0 Mission / Activity — Provide Nuclear Deterrent

L1

The **Force** designed to undertake a mission or activity. The how (current doctrine or new concept) we will best fight to successfully complete the mission.

CASD

This is where we decide how to best undertake provision of Nuclear Deterrent, in this case by putting a strike capability under the sea that is always available. We could put in aircraft or in a bunker. but at sea chosen as best way to achieve mission.

By choosing to undertake the mission this way we need these capabilities at L3

L2 **Functional Capability Groupings** - a useful organisational (rather than system) grouping of capabilities that allows the coherent management of existing solutions and development of future solutions.

L3

The **Capability Output** (effect or service) that the force needs to successfully complete the mission or activity

Nuclear Strike from under water — Anti-submarine warfare — Naval Base Protection — Anti Mine Warfare — etc

L4

The **Capability Building Blocks** that together form a Capability – classified as either Sensors, Deciders or Effectors.

Sense (OGDs, FCDO and DI) — Decide (PM via COBRA) — Effect (Trident)

L5

The **Capability Hosts** providing fly/float/move/drive/walk + carry + survive for Capability Building Blocks

Vanguard

L6

The **Capability Enablers** providing digital, people, training, support, T&E & infrastructure enablers for Capability Building Blocks & Hosts

Nuclear Firing Chain — Pj Euston (Second docking facility in Faslane)

Taking a systems of systems approach (SOSA)

Ministry of Defence

Defence Capability Hierarchy

Defence's Purpose – Protect the Nation & help it prosper

L-2

Defence Outcome 1 | Defence Outcome 2 | Defence Outcome 3

L-1

Defence Campaign 1 | Defence Campaign 2 | Defence Campaign 3 | Defence Campaign 4

L0

The **Missions or Activities** the Campaign requires to be undertaken

Mission / Activity 1 | Mission / Activity 2 | Mission / Activity 3 | Mission / Activity 4 | Mission / Activity 5 | Mission / Activity 6 | Mission / Activity 7 | Mission / Activity 8 | Mission / Activity 9

WHY
(from a Capability perspective)

L1

The **Force** designed to undertake a mission or activity. The how (current doctrine or new concept) we will best fight to successfully complete the mission.

Force 1 (e.g. Task Element) | Force 2 (e.g. Task Force) | Force 3 (e.g. Task Group) | Force 4 (e.g. Task Group) | Force 5 (e.g. Task Force) | Force 6 (e.g. Task Group) | Force 7 (e.g. Task Group)

L2

Functional Capability Groupings - a useful organisational (rather than system) grouping of capabilities that allows the coherent management of existing solutions and development of future solutions.

Functional Capability Group 1 (e.g. Above Water Warfare) | Functional Capability Group 2 (e.g. Under Water Warfare) | Functional Capability Group 3 (e.g. Littoral Warfare) | Functional Capability Group 4 (e.g. Logistics)

HOW
(from a Capability perspective)

L3

The **Capability Output** (effect or service) that the force needs to successfully complete the mission or activity

Capability (Effect / Service) 2 (e.g. Maritime Strike) | Capability (Effect / Service) 3 (e.g. Air Defence) | Capability (Effect / Service) 1 (e.g. Land Strike) | Capability (Effect / Service) 4 (e.g. Anti Submarine Warfare) | Capability (Effect / Service) 5 (e.g. Mine Warfare) | Capability (Effect / Service) 6 (e.g. Theatre Entry) | Capability (Effect / Service) 6 (e.g. Ground Combat) | Capability (Effect / Service) 6 (e.g. Land Strike) | Capability (Effect / Service) 6 (e.g Resupply) | Capability (Effect / Service) 6 (e.g Disaster Relief)

To make decisions we need to be able to trace the reason for any element to exist through a logical structure.

We must structure our data in the right schema.

Selecting any element should show its linkages through the levels

L4

The **Capability Building Blocks** that together form a Capability – classified as either Sensors, Deciders or Effectors.

Cap Bldg Blk 1 (e.g. Sensor – Sonar) | Cap Bldg Blk 2 (e.g. Sensor – Camera) | Cap Bldg Blk 3 (e.g. Decider - CMS) | Cap Bldg Blk 4 (e.g. Effector – Missile) | Cap Bldg Blk 5 (e.g. Effector - Gun) | Cap Bldg Blk 6 (e.g. Sensor - Radar) | Cap Bldg Blk 7 (e.g. Decider - CMS) | Cap Bldg Blk 8 (e.g. Effector - LDEW) | Cap Bldg Blk 9 (e.g. Effector - RFDEW) | Cap Bldg Blk 10 (e.g. Effector - Jammer) | Cap Bldg Blk 11 (e.g. Sensor - Radar) | Cap Bldg Blk 12 (e.g. Sensor – IR Detector) | Cap Bldg Blk 13 (e.g. Decider - CMS) | Cap Bldg Blk 14 (e.g. Effector -

L5

The **Capability Hosts** providing fly/float/move/drive/walk + carry + survive for Capability Building Blocks

Cap Host 1 (e.g. SSBN) | Cap Host 2 (e.g. UUV) | Cap Host 3 (e.g. Frigate) | Cap Host 4 (e.g. Destroyer) | Cap Host 5 (e.g. USV) | Cap Host 6 (e.g. Amphib) | Cap Host 7 (e.g. F35B) | Cap Host 8 (e.g. Merlin) | Cap Host 9 (e.g. UAV) | Cap Host 10 (e.g. Marine) | Cap Host 11 (e.g. LTMP) | Cap Host 12 (e.g. FSS) | Cap Host 13 (e.g. Hospital Ship)

WHAT
(from a Capability perspective)

L6

The **Capability Enablers** providing digital, people, training, support, T&E & infrastructure enablers for Capability Building Blocks & Hosts

Enabler 1 (e.g. Digital - Network) | Enabler 2 (e.g. Infra - Jetty) | Enabler 3 (e.g. Training - Collective) | Enabler 4 (e.g. People - Engineers) | Enabler 5 (e.g. Support - Spares) | Enabler 6 (e.g. Infra - Airfield) | Enabler 7 (e.g. Support - Maintenance) | Enabler 8 (e.g. People - Chefs) | Enabler 9 (e.g. Digital - Security) | Enabler 10 (e.g. Training – Sea Keeping) | Enabler 11 (e.g. T&E - Range) | Enabler 12 (e.g. People – Cap & Acq)

Taking a systems of systems approach (SOSA)

Ministry of Defence

Defence Capability Hierarchy

Defence's Purpose – Protect the Nation & help it prosper

Change Project A
Change Project B
Change Project C

L-2

Defence Outcome 1 | Defence Outcome 2 | Defence Outcome 3

L-1

Defence Campaign 1 | Defence Campaign 2 | Defence Campaign 3 | Defence Campaign 4

L0

The **Missions or Activities** the Campaign requires to be undertaken

Mission / Activity 1 | Mission / Activity 2 | Mission / Activity 3 | Mission / Activity 4 | Mission / Activity 5 | Mission / Activity 6 | Mission / Activity 7 | Mission / Activity 8 | Mission / Activity 9

WHY
(from a Capability perspective)

L1

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L3

The **Capability Output** (effect or service) that the force needs to successfully complete the mission or activity

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HOW
(from a Capability perspective)

L4

The **Capability Building Blocks** that together form a Capability – classified as either Sensors, Deciders or Effectors.

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Using a systems approach like this will enable us to understand the relative value of different change projects to Defence

L5

The **Capability Hosts** providing fly/float/move/drive/walk + carry + survive for Capability Building Blocks

Cap Host 1 (e.g. SSBN) | Cap Host 2 (e.g. UUV) | Cap Host 3 (e.g. Frigate) | Cap Host 4 (e.g. Destroyer) | Cap Host 5 (e.g. USV) | Cap Host 6 (e.g. Amphib) | Cap Host 7 (e.g. F35B) | Cap Host 8 (e.g. Merlin) | Cap Host 9 (e.g. UAV) | Cap Host 10 (e.g. Marine) | Cap Host 11 (e.g. LTM) | Cap Host (e.g. FSS) | Cap Host 13 (e.g. Hospital Ship)

WHAT
(from a Capability perspective)

L6

The **Capability Enablers** providing digital, people, training, support, T&E & infrastructure enablers for Capability Building Blocks & Hosts

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Taking a systems of systems approach (SOSA)

Defence Capability Hierarchy

Ministry of Defence

The Force

Defence's Purpose – Protect the Nation & help it prosper

Defence Outcome 1	Defence Outcome 2	Defence Outcome 3

L-2

L-1

Defence Campaign 1	Defence Campaign 2	Defence Campaign 3	Defence Campaign 4

L0

The **Missions or Activities** the Campaign requires to be undertaken

Mission / Activity 1	Mission / Activity 2	Mission / Activity 3	Mission / Activity 4	Mission / Activity 5	Mission / Activity 6	Mission / Activity 7	Mission / Activity 8	Mission / Activity 9

WHY
(from a Capability perspective)

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HOW
(from a Capability perspective)

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WHAT
(from a Capability perspective)

Taking a systems of systems approach (SOSA)

Ministry of Defence

Defence Capability Hierarchy

Capability

Defence's Purpose – Protect the Nation & help it prosper

WHY (from a Capability perspective)

L-2

Defence Outcome 1 | Defence Outcome 2 | Defence Outcome 3

L-1

Defence Campaign 1 | Defence Campaign 2 | Defence Campaign 3 | Defence Campaign 4

L0 — The **Missions or Activities** the Campaign requires to be undertaken

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HOW (from a Capability perspective)

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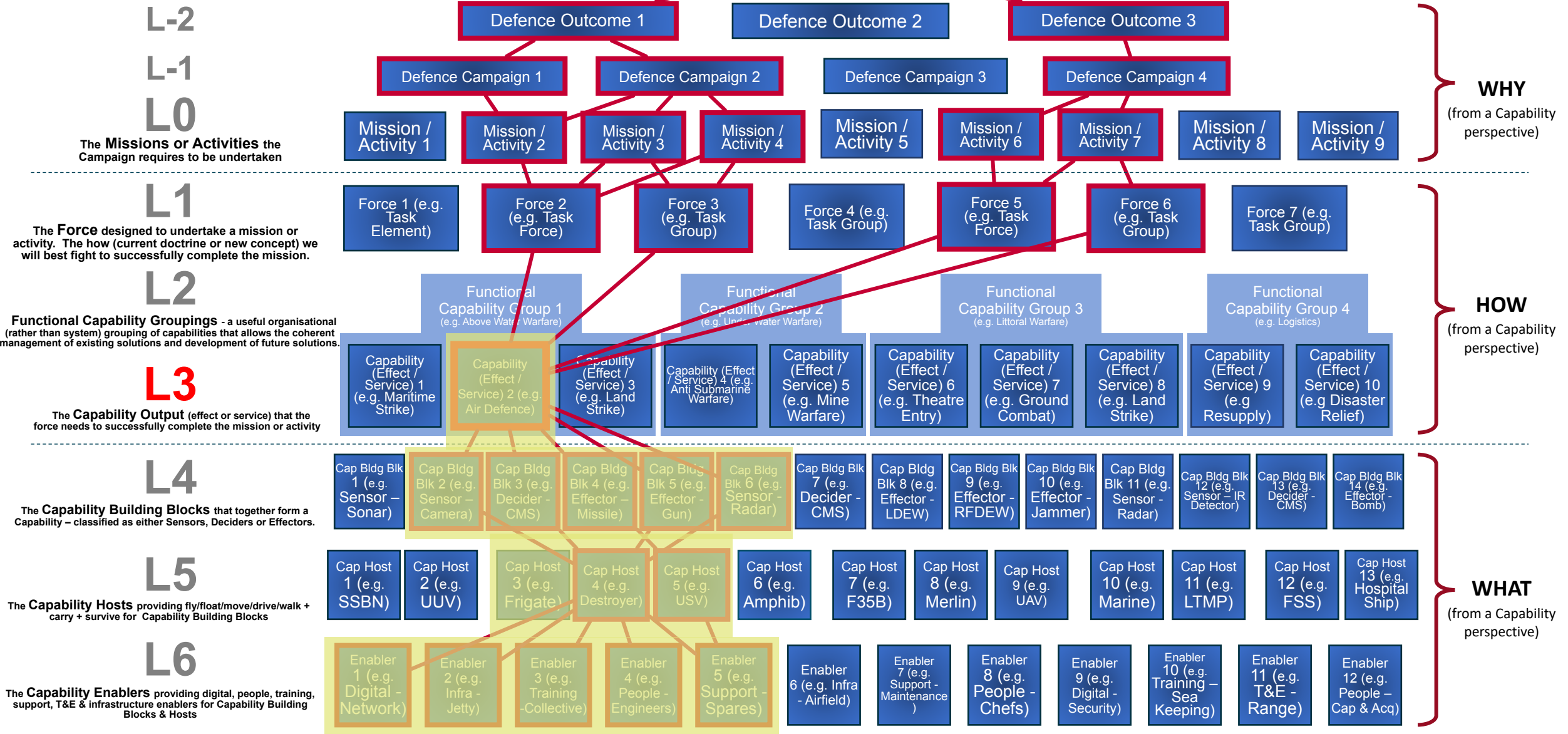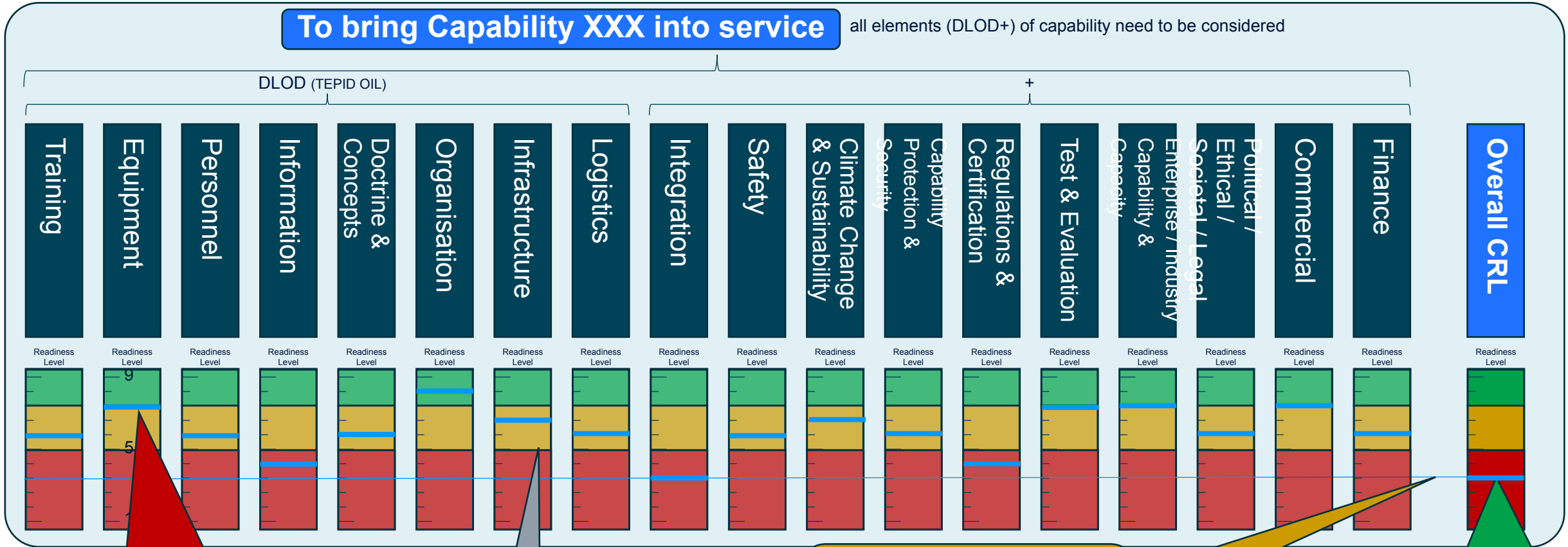
Ministry of Defence

To bring a new capability into service, avoiding the valley of death, think Capability Readiness Level (CRL)!

To bring Capability XXX into service all elements (DLOD+) of capability need to be considered

DLOD (TEPID OIL)   +

Columns (left to right):
- Training — Readiness Level
- Equipment — Readiness Level (9 ... 5 marked)
- Personnel — Readiness Level
- Information — Readiness Level
- Doctrine & Concepts — Readiness Level
- Organisation — Readiness Level
- Infrastructure — Readiness Level
- Logistics — Readiness Level
- Integration — Readiness Level
- Safety — Readiness Level
- Climate Change & Sustainability — Readiness Level
- Capability Protection & Security — Readiness Level
- Regulations & Certification — Readiness Level
- Test & Evaluation — Readiness Level
- Enterprise / Industry Capability & Capacity — Readiness Level
- Political / Ethical / Societal / Legal — Readiness Level
- Commercial — Readiness Level
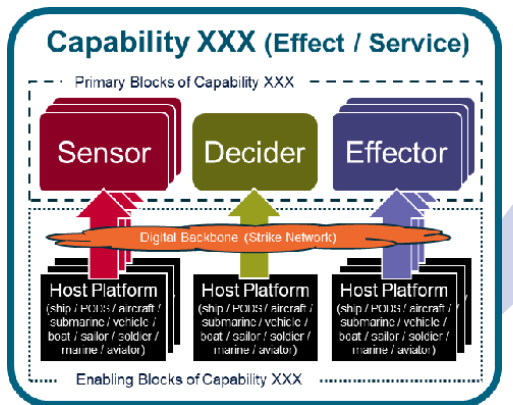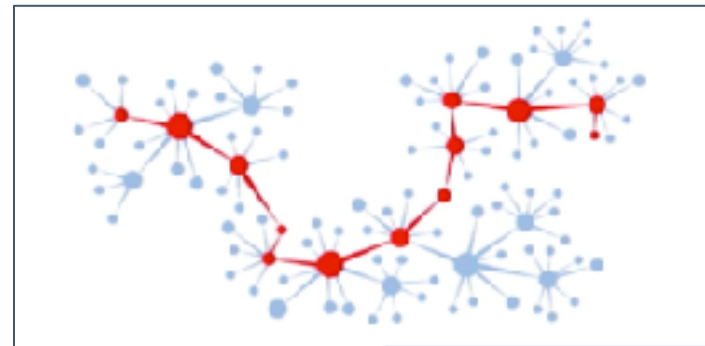- Finance — Readiness Level
- **Overall CRL** — Readiness Level

1. Don't just focus on the Technology (or Equipment) Readiness Level (TRL). This is **almost never** the lowest of the capability element readiness levels.

Example Capability Element Readiness Levels for Capability XXX

2. The overall capability readiness level (CRL) is the **same** as the **LOWEST** of the capability element readiness levels.

3. To bring a capability into service you must focus on raising the level of **all** the capability elements!

SOSA v0.2

Continually developing and iterating FIGHT INTEGRATION

Sensor

Decider

Effector

Becoming a protean Navy and taking a systems of systems approach means …

We will need to continually develop and iterate FIGHT INTEGRATION

System integration of the fight elements means creating an NC/ DE&S led industry resourced team to develop, deliver and continually iterate the areas shown here in grey (the Top Hat).

We will procure additional sensors, additional decider apps additional effectors and host platforms in a manner to ensure compatibility with our SOSA.

Host Platform

Host Platform

Host Platform

In summary …

Any sensor, right decider, best effector

From a fleet of platforms to 10,000 nodes on a strike network

Disaggregation of sense/decide/effect

Protean Navy and taking a Systems of Systems Approach - MarOpC