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Designing for less complexity

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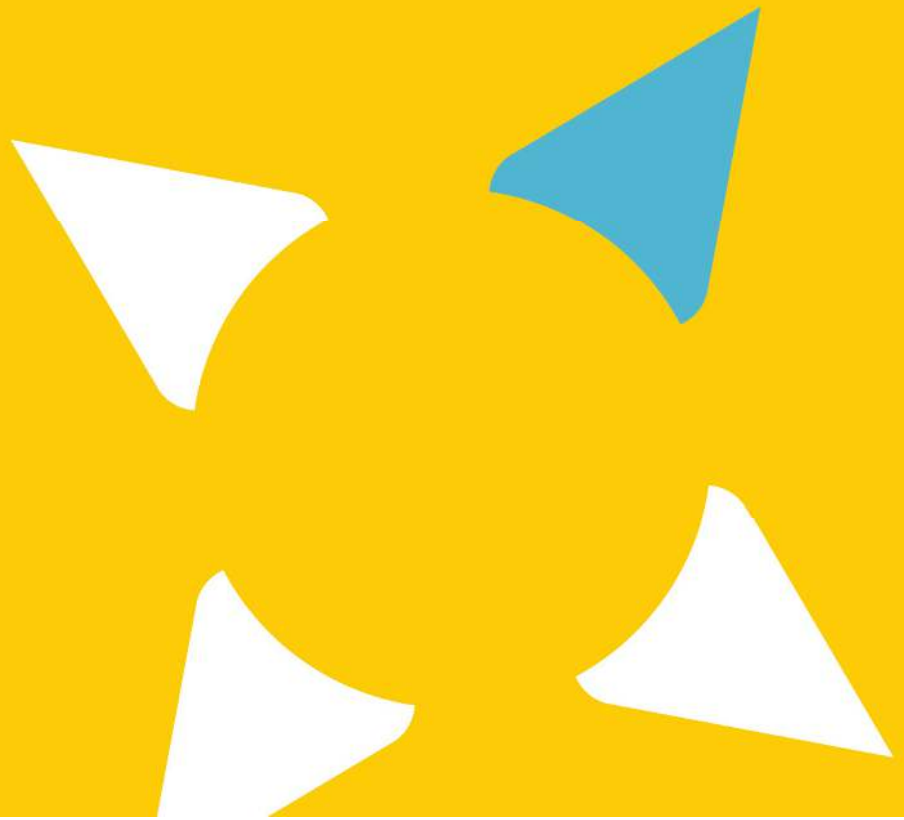
Providence



- Force Design context
- Understanding complexity
- Looking for solutions…

Force Design – ‘To Design the Joint Force’

Design – to **create**, fashion, execute, or construct according to **plan**

Force Design enables Government decisions on spending money and balancing strategic priorities with fiscal priorities.

Design because context is evolving at a rapid pace: more and diverse threats, smarter more potent adversaries, emerging technologies – all call for a significantly more capable Defence force.

Force Design (the final product - noun) vs force design (the process - verb)

Defence Planning

The triumvirate that drives all aspects of Defence planning

Defence undertakes regular reviews of its planning to ensure **alignment of strategy, capability and resources** in ways that are responsive to the evolving strategic environment.

Strategy: Defence Strategic Update (DSU)

Capability: Force Structure Plan 2020 (FSP)

Resources: $575 billion total funding;

$270 billion in capability investment (over the decade 2020–2030)

Defence Planning

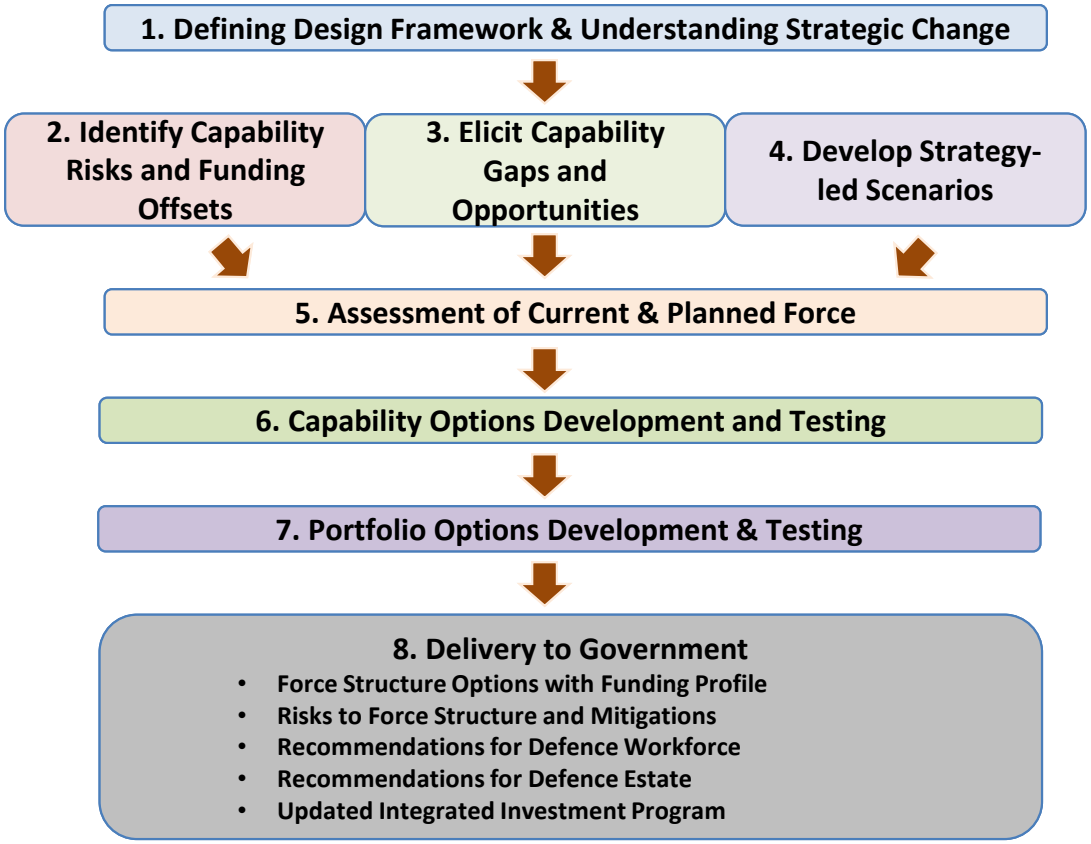
The 2020 DSU addresses changes in our strategic environment, including:

- sharpened US-China competition
- increased use of grey zone tactics
- reduced strategic warning times
- intensified regional military modernisation
- threats to human security, such as COVID-19 and natural disasters

The 2020 FSP addresses 2020 DSU challenges **to deliver** an ADF that:

- is lethal and delivers military effects to meet National security objectives
- adapts to technological advances
- is able to meet increased levels of commitment to disaster relief, evacuation operations, counter terrorism, border security and cyber-attack

Force Structure Planning



This plan has been informed by assessments from Australia's security agencies and partners, as well as clear guidance from Government.

Experimentation and analysis, conducted in Australia and overseas, tested both the current force and proposed new capabilities against a broad range of classified scenarios over a 20 year period and managing a number of concurrent tasks.

The major decisions & key capability plans are outlined in the 2020 Force Structure Plan.

Force Structure Plan 2020

Maritime – approx. $75 Billion
- Surface and Above Water Combat
- Undersea Combat and Surveillance
- Maritime Mine Warfare, Patrol and Geospatial
- Maritime Combat Support and Amphibious Warfare
- Maritime Command, Control, Cyber, Electronic Warfare

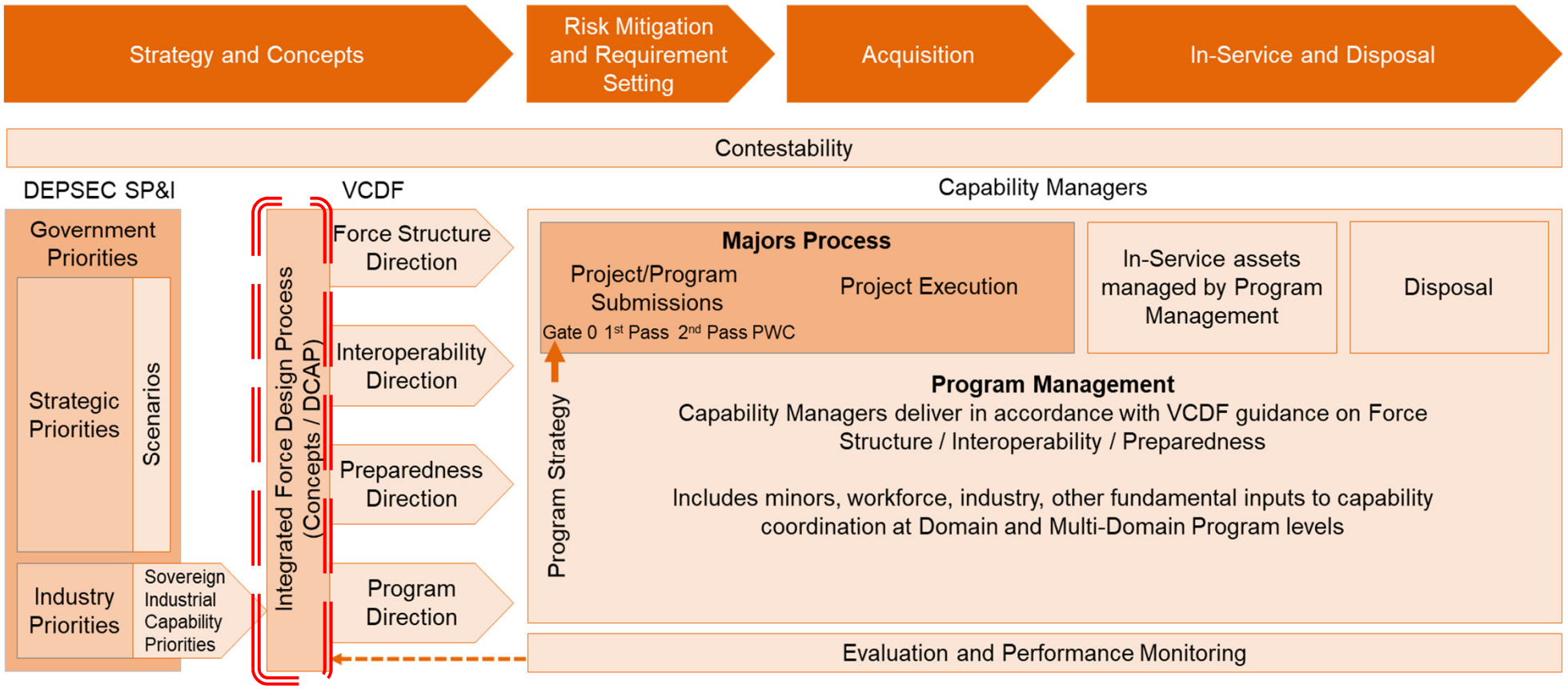
Land – approx. $55 Billion
- Land Combat Vehicles
- Land Combat Support
- Land Combat Mobility
- Battlefield Aviation
- Dismounted Systems
- Special Operations
- Land Intelligence, Surveillance, Reconnaissance, Electronic Warfare
- Land Command Control Communications

Space – approx. $7 Billion
- Space Services
- Space Control
- Satellite Communications
- Space Situational Awareness

Air – approx. $65 Billion
- Air Combat
- Intelligence, Surveillance, Reconnaissance, Electronic Warfare
- Air Mobility
- Combat Air Support
- Integrated Air & Missile Defence
- Maritime Patrol & Response

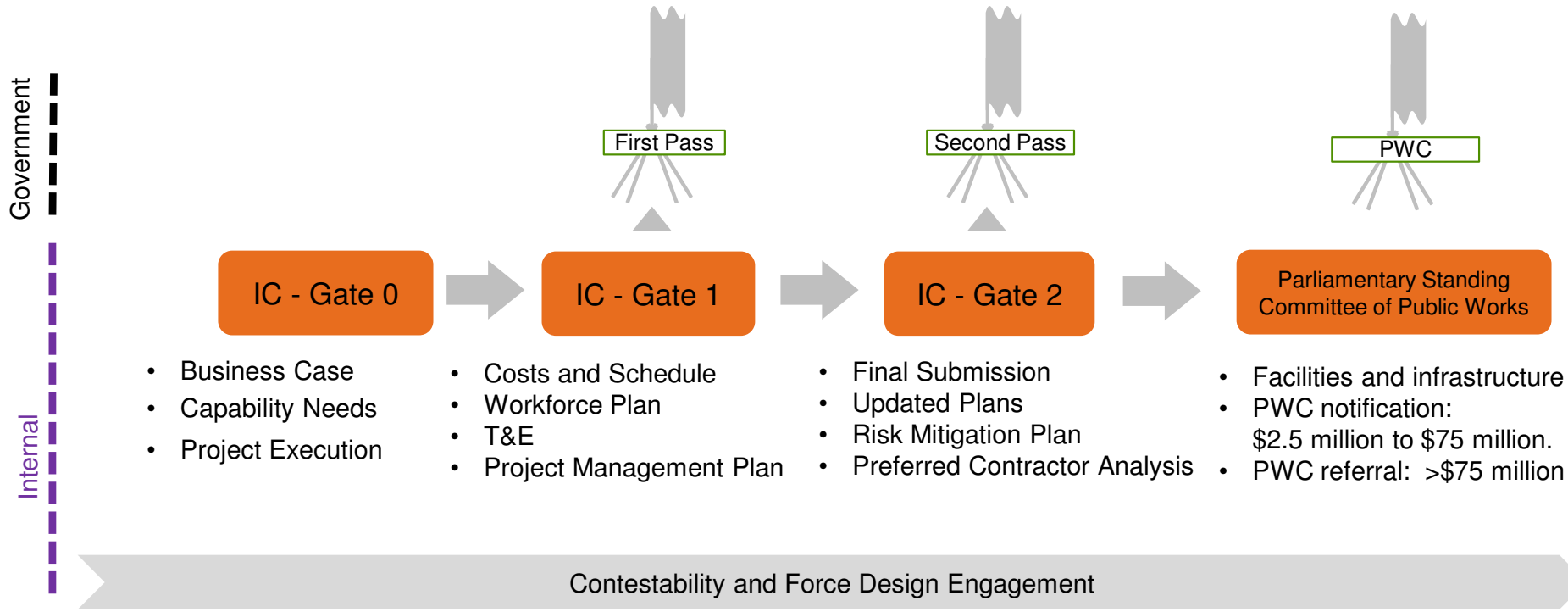
Information & Cyber – approx. $15 Billion
- Joint Cyber
- Joint Command, Control, Communications and Computers
- Joint Intelligence, surveillance and reconnaissance
- Joint Electronic Warfare
- Strategic Intelligence and Cyber
- Enhanced Cyber Security Defences

One Defence Capability Model



Two Pass Approval Process

(through Investment Committee that JFA chairs)



Process, Process, Process
Planning & Approving

Acquiring a ship requires understanding across safety, design, construction, operation, maintenance, disposal, regulation, training, environmental protection, installations and infrastructure, industrial base capacity, and workforce.

Force Design Division sits with the Vice-Chief of the Defence Force (VCDF).

VCDF is the Joint Force Authority (JFA) and chair of Investment Committee.

As chair of Investment Committee VCDF delivers and oversee the Integrated Investment Program (IIP) to progress future capability requirements.

Understanding Complexity

The word “complex” comes from two Latin words “com” (“together”) and “plectere” (“to entwine”)

Complexity means entwining many parts together – making it harder to understand them as a whole, as well as individually because of their new entanglement

Design can *introduce* complexity via combinations of, and interactions between, products, processes, users and management

Uncertainty can *introduce* complexity via nonlinearity, randomness, collective dynamics, and emergence of unforeseen behaviour

Complexity can be a mental burden as each decision requires thinking about multiple facets:

- How the entire portfolio comes together coherently
- Dependencies, and the first-second-third order impacts
- Measuring how the entwined systems deliver value

Root Causes of Complexity

- Portfolio complexity due to interdependencies (workforce, infrastructure, ICT enabling capabilities)
- Speed of innovation & new types of competition
- Global uncertainties and constant change impacting strategic goals and objectives
- Complex supplier networks and regulatory frameworks
- Number of stakeholders and information flows between them
- Relationships between stakeholders, suppliers, overlapping of activities, methods, and techniques

- *Could we reduce the number of parts or reduce the entanglement (dependency)?*
  Might not work in a Defence portfolio as we need a diverse portfolio

Understanding Might Help?

- Complexity drivers within the portfolio – what drivers can be targeted to reduce complexity
- Impact of duplication of processes, people and systems – what can we harmonise?
- Cost of changing requirements and scope creep
- Understand complex and uncertain supply chains
- Value of individual portfolio elements and value of combinations
- Trade-offs between value and complexity
- What can we control and what is beyond our control

Reducing complexity

- Regular activities to review all moving parts and determine where complexity has gotten out of hand

- Better organise activities and communication both vertically down as well as across horizontally
    - Relatively simple projects can become complicated when communication gets messy
    - Reduce processes, meetings and activities that have become unnecessary

- Understand what decisions are made at what level, and ensure they are not bogged down with details

- Leverage data management principles - data modelling, data governance, metadata, data stewardship.

Reducing complexity in design

- Progressive Disclosure of information: focus attention by reducing clutter, confusion, cognitive load
- Progressive Enhancement: build structured layers that become more complex only when appropriate.
- Scenarios – to check dependencies (linkages), risk drivers, choke points
- Match strategic requirement to drivers of complexity, so as to standardise & harmonise requirements
- Portfolio level understanding of enablers such as Estate and Workforce
- Know what you want, consider what is really important and prioritise what delivers value
- Resist scope creep and stay strategically aligned
- Industry secondments to understand best practices and standards.

- Welcome your thoughts or solutions…

”*Less, but better*” - Dieter Rams, German Designer