INTRODUCTION TO THE
CAPABILITY LIFE CYCLE
AND
CAPABILITY MANAGEMENT
PRACTICES

Part III

Dr Mike Ryan
Dr Shari Soutberg
Your Presenters

Dr Mike Ryan holds BE, MEngSc and PhD degrees in electrical engineering from the University of New South Wales. He is a Fellow of Engineers Australia (FIEAust), a Chartered Professional Engineer (CPeng) in electrical and ITEE colleges, a Senior Member of IEEE (SMIEEE), a Fellow of the International Council on Systems Engineering (INCOSE), and a Fellow of the Institute of Managers and Leaders (FIML). Since 1981, he has held a number of positions in communications and systems engineering and in management and project management. Since 1998, he has been with the School of Engineering and Information Technology, University of New South Wales, at the Australian Defence Force Academy where he is currently the Director of the Capability Systems Centre. His research and teaching interests are in communications and information systems, requirements engineering, systems engineering, project management, and technology management. He is the Editor-in-Chief of an international journal, and is the Chair of the Requirements Working Group INCOSE. He is the author or co-author of twelve books, three book chapters, and over 200 technical papers and reports.

Dr Shari Soutberg has over 30 years experience in Defence, with a focus on materiel acquisition, sustainment, organisational improvement and reform. Shari is currently an Industry Fellow at the UNSW Capability System Centre. Significant activities include development of a framework for delivery of joint force outcomes and training courses on capability development practices applicable to Defence. Prior to this, Shari was the acting Chief Systems Engineer for CASG and a member of the First Principles Review (FPR) Capability Lifecycle (CLC) team which developed capability management reform initiatives. As Director Systems Engineering and later Director Materiel Engineering in CASG, Shari led the development and implementation of Defence engineering policy and guidance, including fundamental changes arising from the WHS Act 2011. Shari provided stewardship of the Defence Engineering and Technical Job Family through establishing learning and development structures. She also supported Defence corporate engineering and technical workforce planning including industrial relations engagement. Whilst in the Office of the Parliamentary Secretary for Defence Industry, Shari was a significant contributor to the Defence Industry Policy leading to the role of Director Industry Policy. After joining the Department of Defence, Shari worked on maritime platforms and equipment and as a project manager for naval projects. Shari has a Bachelor of Engineering (Electrical), Masters of Management Economics, and a Doctor of Philosophy which addressed requirements development in Defence capability management.

Books
Book Chapters


Major Recent Consultancies

1999 An analysis of the effect of radio-frequency directed-energy weapons (RF DEW)
1999 Development of an architecture for a battlespace communications system for the Australian Army
2000 An analysis of the fitness-for-purpose of SSB mode for receive-only Link-11 communications
2001 An investigation into the impact of environment on a ship-based UHF SATCOM receiver
2002 C4I study and development of technical specification for ATHOC: Athens 2004 Olympic Games
2002 Land 125 (WUNDURRA) Soldier Combat System—System Integration Study—Communications
2003 Independent validation and verification (IV&V) of NZ Joint Command and Control System (JCCS)
2003 Land 125 (WUNDURRA) Soldier Combat System—System Integration Study—Security
2004 Development of Strategy Paper for the ADF Tactical Information Exchange Environment
2005 Development of a Security Architecture for the Land Force Information Network
2005 Development of a Space Policy for the Australian Army
2005 Development of a web-services strategy for Air Services Australia
2005 Review of functions and responsibilities for delivery of the ADF Battlespace Network
2005 Strategic appreciations for the layers of the Defence Information Infrastructure (DII)
2005-6 Rewrite of Defence Approved Technology Standards List (ATSL)
2006 Independent validation and verification (IV&V) for JP2072
2007 Independent validation and verification (IV&V) for JP2097
2007 Advice on design acceptance for JP141/2087
2007 Systems Engineering Independent Review Team for JP2072
2007 Independent validation and verification (IV&V) for Land 75/125 BMS T&E
2007 Physical/Functional Audit Review for the Hazard Prediction Modelling and Geospatial Subsystem
2008 Development of system architecture / functional specification for Modular Engineer Force
2008 Development of CDD suite for Land 125 Phase 4
2009 Business Case for Annual Defence-wide EW Capability Review
2009 Business Case for Defence-wide EW Training and Education Review
2010 JP 2089 Phase 3B—Tactical Information Exchange Domain—ARH—Requirements Workshop facilitation
2010 Rewrite of Defence Approved Technology Standards List (ATSL)
2011 IV&V for ADF EW Training Needs Analysis
2011 Review of AIR 5431 OCD
2012 Requirements Workshop for ADF Enterprise Content Management and Collaboration System (ECMS)
2012-3 JP 2030 Phase 8 Evolution 1 and 2 Operational Test and Evaluation (OT&E) Documentation Update
2015  Revision of Defence Simulation Strategy and Roadmap
2015  AIR 9000 Capability Development Document Redevelopment
2015  AIR 9000 Lifecycle Cost Analysis Modelling
2016  AIR 6500 Facilitation and Modelling
2016  AIR 9000 Life cycle Modelling
2016  Lifecycle Modelling—LAND 2110 and LAND 907
2016  Land Network Integration Centre Test & Evaluation Study
2016  Land Training Areas and Ranges (LTAR) Design Facilitation
2017  SEA129 Modelling
2017  SEA1000 Through life support modelling
2017  SEA 1180 Ship Zero functions development
2017  HJCM I2 Framework (I2F) Development
2017  HJCM IAMD IV&V
2017  CASG Report on the Schedule Compliance Risk Assurance methodology (SCRAM)
2017  JP91001 FPS and OCD Development IV&V
The Capability Life Cycle (CLC) and Capability Management Practices

Dr Mike Ryan
Dr Shari Soutberg

Day 4: ILS in the CLC

- ILS as part of the CLC.
- Elements of ILS.
- Analyses which underpin ILS:
  - Supportability Analysis.
  - Logistics Support Analysis.
- Key ILS documents.
Day 4: Procurement & Contracting

- Legislative and Policy context.
- Core Principles.
- Procurement and Contracting: Managing Risk.
- Procurement-related Delegations.
- Smart Buyer.
- Implementing procurement and contracting.
  - Procurement Life Cycle.
  - Contracting Templates
    - Tailoring, Content

Day 4: Assurance & Risk Management

- Describe Risk Management.
- How Risk Management is applied across the CLC.
- Describe Assurance.
- How Assurance is applied across the CLC.
Integrated Logistics Support

Logistics

- ADDP4.0 Defence Logistics defines logistics ‘as the science of planning and carrying out the movement and maintenance of forces’.
- It encompasses Defence activities including:
  - design and development, acquisition, storage, movement, distribution, maintenance, evacuation and disposition of materiel;
  - transportation of personnel;
  - acquisition or construction, maintenance, operation, and disposition of facilities;
  - acquisition of furnishing of services; and
  - medical and health support.

DMM (LOG) 04-0-001
Sustainment & Asset Management

- As an asset-intensive business, Defence manages its physical assets consistent with Asset Management principles, i.e., life-cycle management to meet enterprise objectives.
- Asset Management involves the balancing of costs, opportunities, and risks against the desired performance of assets, to achieve the organisational objectives.
- ISO 55000 Asset Management documents the fundamentals upon which Asset Management is based.
- Sustainment Management (and Asset Management) concepts and language are being progressively introduced into Defence logistics guidance.

Defence Logistics

- A core goal of Defence Logistics is to contribute to the preparedness of the ADO through acquisition and through-life support of military equipment and supplies.
- A key challenge is balancing how these preparedness requirements are met while optimising Life-Cycle Costs (LCC).
Preparedness

- Preparedness is a measure of how ready and how sustainable the ADF is to undertake military operations.
- The key aspects of preparedness from a materiel perspective are:
  - equipment reliability (how reliable is the equipment);
  - equipment maintainability (how easy is it to make the equipment serviceable and keep it that way); and
  - equipment availability (how well can the Support System manage the equipment assets – a combination of asset numbers, reliability and maintainability).

Source: DMH (LOG) 04-01-002

Life Cycle Costs (LCC)

- LCC is the total of all costs over the life of a Materiel System and includes all aspects of operating and supporting a Materiel System.
- LCC includes costs of equipment, facilities and personnel and can be viewed in terms of:
  - asset costs (including inventory);
  - maintenance costs (including all aspects of the maintenance program and pipeline);
  - personnel costs (operating and supporting a Materiel System); and
  - operating costs.

Source: DMH (LOG) 04-01-002
The Capability Life Cycle (CLC) and Capability Management Practices

Defence Logistics

• Defence Logistics contributes to the delivery of force effects through the key functions of:
  – force generation (which includes requirements definition and acquisition) and
  – in-service support, including preparedness management, support to operations and disposals.
• Logistic support is effectively provided within two support dimensions: capability support and operations support.

Source: DEFLOGMAN Volume 2 Volume 10 Chapter 3

Two aspects of Defence Logistics

• Capability support:
  – support needed to acquire and support capabilities in-service and to ensure that capabilities meet the preparedness requirements
  – includes the definition of support requirements, acquisition of capability and in-service support, which encompasses preparedness management and support to Defence operations.
• Operations support:
  – support needed to deploy and redeploy a tailored force and sustain it for the duration of an operation.
  – is enabled by, the capability support dimension, in that it mounts and sustains forces using the logistics system established in the capability support dimension.

Source: DEFLOGMAN Volume 2 Volume 10 Chapter 3
Integrated Logistics Support (ILS)

- US DoD developed ILS to address availability challenges for complex Materiel Systems and escalating support costs.
  
  Para 15.4 DEFLOGMAN Volume 2 Volume 10 Chapter 15

- ILS is a management function that provides the initial planning, funding, and controls which help to assure that the ultimate consumer (or user) will receive a system that will not only meet performance requirements, but one that can be expeditiously and economically supported throughout its programmed life cycle.


ILS in Defence

- “Within the Defence context, ILS is a management discipline that addresses LCC and supportability requirements throughout all phases of the CLC.”

  Source: DMH (LOG) 04-01-002, para 5.1

- Aim of ILS is to enable supportability through a range of means (including influencing design) with cooperation between disciplines such as systems engineering and logistics.

  Para 15.4 DEFLOGMAN Part 2 Volume 10 Chapter 15

- All areas of ILS are integrated.
Supportability

“The degree to which the Mission System design characteristics and the planned or existing Support System enable preparedness requirements to be met”.

This ensures that the Materiel System is available to perform when required and is sustainable for the period required, while minimising LCC and complying with other legislative, regulatory and policy guidance.

Materiel System = Mission System + Support System

Supportability

- Supportability for a Mission System is achieved through its design, and is influenced by how the Mission System is used in the operating environment.
- Supportability for the Support System is also a factor of design, which encompasses the required quantities of Support Resources, the environment under which support must be provided, the processes to be employed, and the organisations involved in the provision of support.
- A complete Support System is made up of many different Support System Components, organisations, processes and personnel.
The discipline of ILS is conducted almost solely within the capability support dimension, although the consequences of ineffective ILS will manifest themselves in ineffective support to operations and ultimately ineffective operations.”

Source: DEFLOGMAN Volume 2 Volume 10 Chapter 3

Defence Logistics and ILS

• ILS is a component of logistics which is focused on achieving cost-effective and value-for-money support for a Materiel System comprising both the Mission System and Support System.

Defence Policy on ILS

Defence is to apply the principles and practices of ILS during all phases of the Capability life-cycle to ensure that the required Supportability outcomes are achieved, at a minimised LCC and commensurate with operational, preparedness, regulatory, legislative and contractual requirements.
FIC and ILS

- Within the ADF, capability is generated by the combination of all FIC comprising organisation, personnel, collective training, major systems, supplies, facilities and training areas, support, and command and management.
- Focus for ILS is on logistics inputs that are required to generate and sustain capability.
- ILS generally addresses:
  - the mission system (prime equipment); and
  - the support system required for this equipment.

*Para 15.4 DEFLOGMAN Volume 2 Volume 10 Chapter 15

Focus of ILS in relation to FIC

Note: Support System development for a materiel/major system can leverage or augment relevant FIC elements
Defence Logistics to ILS

**Defence Logistics**
1. Force generation
2. In-Service Support

**Capability Support**
- Define, Acquire and in-service support of capabilities

**Operations Support**
- Support to deploy and sustain the force during operations

**ILS**
- All activities required to achieve supportability for the mission and its support system

**Mission System**
**Material System**
**Support System**

ILS influences design of the Mission System with supportability in mind.

ILS expected to meet:
- Preparedness objectives
- Optimised Life Cycle Costs (LCC)
- Value for Money

Defence defines the Support System through five Support System Constituent Capabilities (SSCC)

ILS applied across the CLC

ILS is applied to all activities across the CLC which help deliver supportability for the mission system and its support system:

- management,
- needs analysis,
- requirements determination,
- design and development,
- acquisition and procurement,
- implementation,
- verification and validation (V&V),
- introduction into service,
- support,
- performance management and
- disposal.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3
Support elements addressed through ILS

The Support System is made up of different and interrelated elements (known as ILS or Support Elements) that encompass people, products and processes.

- These Support Elements are the elements that ILS needs to address to ensure that effective support is provided.

- ILS considerations for designing, establishing and maintaining the Support System must include understanding of which Support Elements are being provided by the project or another entity.

Source: DMH (LOG) 04-01-002

Support elements addressed through ILS

The support elements are all functions and resources necessary to ensure that each mission system is effectively supported during the in-service phase:

- engineering support;
- maintenance support;
- supply support;
- training support;
- packaging, handling, storage and transportation (PHS&T);
- facilities;
- support and test equipment (S&TE);
- personnel;
- technical data; and
- computer support.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3
### Support System Constituent Capabilities

- Defence groups the support elements that comprise the Support System through five *functional* categories (or sub-domains), which are known as the Support System Constituent Capabilities (SSCC):
  1. Operating Support
  2. Engineering Support
  3. Maintenance Support,
  4. Supply Support, and
  5. Training Support.

### SSCC Elements

1. **Operating Support Capability.** This capability encompasses the support elements of: operating facilities system operators, support equipment, operator manuals and technical data, operating support procedures, and operating support information systems.

2. **Engineering Support Capability.** Engineering support encompasses the support elements of: engineering facilities, engineering personnel, engineering support and test equipment, engineering technical data, engineering processes, engineering information management system, and software support.
### SSCC Elements

**3. Maintenance Support Capability.** Maintenance support is the capability which includes the support elements necessary to develop, establish and integrate a maintenance support system capable of sustaining a system throughout its life. The capability comprises the elements of: maintenance facilities, maintenance personnel, maintenance support and test equipment, maintenance technical data, maintenance processes, and maintenance information management system.

<table>
<thead>
<tr>
<th><strong>SSCC Elements</strong></th>
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<tbody>
<tr>
<td><strong>4. Supply Support Capability.</strong> Supply support encompasses the following support elements: supply facilities, supply personnel, supply support equipment, supply technical data, supply processes, supply information management system, spares, and packaging.</td>
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<td><strong>5. Training Support Capability.</strong> The training support capability includes the support elements: training facilities training personnel, training equipment, training materials and other technical data, training processes, and training information management system.</td>
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Requirements on ILS practice

- ILS operates within a broader framework of legislation (such as WHS and environmental laws), regulatory requirements (such as technical regulations), contractual obligations (such as Intellectual Property and liability provisions), and other Defence policy.
- Objective of ILS is supportability at optimised LCC commensurate with operational, preparedness, regulatory, legislative and contractual requirements.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3

Defence Policy context and implications

- Defence policy calls for application of the principles and practices of ILS during all phases of the capability life-cycle to ensure that:
  - required supportability and materiel sustainment outcomes are achieved,
  - at an optimised LCC,
  - within operational, regulatory, legislative and contractual requirements and constraints.
- ILS includes all activities necessary to address supportability for both the Mission System and its Support System
- ILS is the life-cycle discipline that addresses supportability.

Source: DMH (LOG) 04-01-002
Policy context and implications

• In accordance with CPR value-for-money principles, Defence is required to acquire capabilities that meet specified performance requirement that will be fully supportable at an optimised LCC.

• ILS principles and practices are to be applied to Materiel Systems throughout the CLC. This includes the design of the Mission System and the Support System.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3

Relationship between CLC and ILS

• Capability Support is a core outcome of the CLC.

• CLC requires a Whole of Life and Whole of FIC perspective for any proposal.

• A CLC proposal must address all FIC elements including ILS for the major systems which in turn are made up of:
  – Mission System needs and requirements (operational, functional and technical perspectives)’.
  – Support System needs and requirements to enable operational outcomes and in-service sustainment.

• PES must define and cost all FIC.
The Capability Life Cycle (CLC) and Capability Management Practices

Preparedness / LCC balance

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Materiel System

- Operational Functions & Performance (DA)
  - Speed
  - Range
  - Endurance
- Availability
  - Reliability (DA)
  - Maintainability (DA)
  - Supportability (DA)

Asset Costs

Drives

Availability

- Reliability (DA)
- Maintainability (DA)
- Supportability (DA)

Asset Costs

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Lower asset cost through lowering R, M, and S
The Capability Life Cycle (CLC) and Capability Management Practices

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Availability

• Reliability (DA) |
• Maintainability (DA) |
• Supportability (DA) |

Asset Costs

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Systems Engineering provides basis for design analysis across Mission and Support Systems

DA: Design Attribute

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DA: Design Attribute
The Capability Life Cycle (CLC) and Capability Management Practices

**ILS Analyses**

**Supportability Analysis (SA)**
Supportability Analysis (SA)

- The principal analytical tool of ILS, is Supportability Analysis (SA) which is a structured and tailored process of defining Supportability requirements throughout the Materiel System life cycle.
- Supportability significantly influences both Materiel System preparedness, operational and support requirements, and LCC/TCO.
- SA addresses the inter-related issues of Mission System design, Support System development and optimising resources.
- SA provides interaction between the engineering and logistic support processes.

Source: DEFLOGMAN Volume 2 Volume 10 Chapter 15

Defence Supportability Analysis Policy

“Defence is to apply the principles and practices of SA during all phases of the capability life cycle to ensure that the required Supportability outcomes are achieved, at a minimised LCC and commensurate with operational, preparedness, regulatory, legislative and contractual requirements.”

Para 15.4 DEFLOGMAN Part 2 Volume 10 Chapter 15
Mission System Supportability

- A goal of ILS is to improve mission system supportability by influencing the definition, design, development and selection of the mission system
- Mission system supportability influences the support system requirements and the design of the support system
- ILS activities must consider the influence of mission system supportability on the support elements as well as options for improving mission system supportability.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3

Mission System Supportability

- The goal of supportability analysis is to reduce cost and effort needed to support the mission system and improve mission system preparedness.
- ILS practitioners must be involved in design activities for the mission system to ensure that optimal balance across the mission and support system achieved that delivers required preparedness at optimised LCC.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3
**Support System Supportability**

- “Supportability of the Support System is judged in the way that it contributes to mission system preparedness by providing the required logistic services in a cost-effective and efficient manner.” Source: DEFLOGMAN Part 2 Vol 10 Chapter 3 para 3.20

- A Support System which itself is poorly designed and reflects inadequate supportability will contribute to increased costs, inefficiency and unavailable Support System components which will likely reduce the preparedness of the mission system.

- Supportability factors for the Support System can be similar to that for a Mission System (for example, reliability, maintainability and deployability).

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**Support System Supportability**

- Supportability of the support system components influences the effectiveness of the support system and in turn the mission system preparedness.

- For example:
  - maintenance support is affected by availability of contributing elements such as access to skilled personnel, and
  - Support T&E supportability can be measured by reliability, maintainability and deployability.

Source: DEFLOGMAN Part 2 Vol 10 Chapter 3
Supportability Analysis (SA) in Defence

- According to Defence guidance, SA is any form of analysis into aspects of the Materiel System (Mission and Support) to identify and analyse ways to improve that supportability.
- The analysis process may be formal or informal; the formal approach is applied through LSA and related disciplines.

Source: DMH (LOG) 04-01-002

Logistics Support Analysis (LSA)
Logistics Support Analysis (LSA)

- In more detailed and structured applications of SA, the tailored application of DEF(AUST) 5691 is required.
- LSA provides an analytical foundation to achieve Supportability and ILS objectives.
- LSA is the analytical tool that integrates ILS and the engineering functions to ensure that the system design and operational requirements have been properly applied through a single analytical approach.
- LSA is used to optimise LCC and system performance (including reliability and availability) therefore related analyses are RAM and LCCA.

Source: DMH (LOG) 04-01-002

LSA and SE

- LSA can be viewed as the combination of scientific and engineering processes that are used to achieve a balance between the operational capability, cost, and logistics support throughout the life-cycle of a Materiel System.
- LSA is based on SE techniques to provide an effective and consistent analytical techniques for identifying supportability requirements for materiel systems (Ref: DEFAUST 5691)
- LSA enables support considerations to influence design requirements, or the selection of a design, for a Materiel System.

Source: DMH (LOG) 04-01-002
LSA and SE

• LSA applies a SE approach to analyse the supportability of the Mission System and the Support System.

• LSA is an iterative process of identification, analysis, evaluation and trade-off, focussed on the supportability requirements for the Mission System and the design of the Support System.

• LSA addresses operations of the Mission System and necessary support tasks, to define requirements for the Support System.

Source: DMH (LOG) 04-01-002

Benefits of LSA

• “LSA provides a comprehensive means for identifying, defining, analysing, qualifying and quantifying logistics requirements to achieve balance among performance, operational readiness, reliability, maintainability, vulnerability, survivability, operating and support costs, and Supportability and logistics requirements, thereby optimising the overall Support System.”

• LSA describes the process for identifying and analysing the functional Supportability requirements consistent with the ILS program and is tailored according to the equipment being sought.

Source: DMH (LOG) 04-01-002
Benefits of LSA

• The benefits of applying LSA are:
  – an all-encompassing approach to SA covering both Mission Systems and their Support Systems;
  – coordinated development of the entire logistics support package; and
  – a consistent and traceable process to reduce LCC and improve preparedness in accordance with ILS goals, and to comply with program constraints.

Source: DMH (LOG) 04-01-002

Analyses related to LSA

• Early LSA is referred to as Front End Logistic Support Analysis (FELSA), which provides analytical support for the investigation of alternate support concepts in the early phases of the CLC.

• LSA has a close relationship with Reliability, Availability and Maintainability (RAM) and Life Cycle Costing Analysis (LCCA).

Source: DMH (LOG) 04-01-002
DMSP (LOG) 04-0-004
Front End Logistic Support Analysis

- Front End Logistic Support Analysis (FELSA) is an abridged form of LSA that is conducted in the early phases of the CLC.
- FELSA is used to investigate functional requirements, the gross logistics resource requirements for various Capability options, and initial high-level analysis of System Supportability and Support System opportunities and alternatives.

Source: DMM (LOG) 04-0-001

Reliability, Availability and Maintainability

- RAM is a set of integrated concepts, disciplines and practices that deal with the preparedness and whole-of-life cost aspects associated with Mission Systems.
- RAM has a direct impact on operational capability and life-cycle costs.
- The RAM characteristics of a system are major drivers of operating and support costs.

Source: DMM (LOG) 04-0-001
Reliability

• Reliability of materiel is its ability to remain in operation for a stated period without experiencing a mission critical failure.

• The ability for Defence missions to be successfully completed missions is significantly dependent on the materiel system's reliability and avoiding mission critical failure of materiel.

• Reliability is an inherent feature of a system's design.

Source: DMM (LOG) 04-0-001

Availability

• Availability is the probability that the materiel is available to perform its specified function when called for at an unknown (random) point in time.

• The availability of a System depends on the reliability of its Mission and Support Systems.

• In the ADF, availability implies confidence that an item will be available for use when required.

• The availability requirements for a System may vary as the mission requirements vary.

Source: DMM (LOG) 04-0-001
Maintainability

- Maintainability of materiel is its ability to be restored to, or preserved in, a specified condition.
- The maintainability of a system is an inherent design characteristic and, if not considered early in acquisition, may cause equipment to consume resources in maintenance activities unnecessarily, thereby jeopardising the ADF’s ability to initiate and successfully complete missions; as well as increasing the total cost of ownership.

Source: DMM (LOG) 04-0-00

RAM

- RAM concepts are integrated with LSA and LCCA concepts (through SE) to ensure Materiel System optimisation.
- RAM is also key to safety management (from an equipment reliability and failure perspective).

Source: DMH (LOG) 04-01-002
Consideration of RAM

• RAM should be considered for all Acquisitions, including Commercial-off-the-Shelf (COTS) and Military-off-the-Shelf (MOTS) equipment.

• RAM requirements are initially defined in the Risk Mitigation and Requirements Setting phase and addressing readiness and sustainability objectives (where this represents a force’s ability to initiate and continue to conduct operations).

• During acquisition, there should be assurance that the systems being procured satisfy RAM characteristics derived from a capability’s readiness and sustainability objectives.

Source: DMM (LOG) 04-0-001

Life Cycle Costing Analysis (LCCA)

Source: DMM (LOG) 04-0-001
Life Cycle Costing Analysis (LCCA)

- LCCA is the identification and analysis of all costs incurred in acquiring, operating and supporting, and disposing of a Materiel System.
- LCCA is used to identify the budget implications of capital investment decisions and the cost impact of various design and support options for Materiel Systems.
- LCCA is a key analytical tool used by ILS personnel, In-Service Support staff, and engineers in the development, production, and through-life support of Materiel Systems.

Life Cycle Costing Analysis (LCCA)

- LCCA is used to identify LCC estimates and cost drivers.
- Each LCC estimate represents a range of plausible costs for an asset (or Materiel System), where the range is influenced by the possible variations of the key cost drivers.
- LCC can be used for comparative assessment of alternative design and support options as part of Systems Engineering and LSA processes.
- LCCA can be used to improve sustainment by conducting trade-off and sensitivity analysis.

Source: DMH (LOG) 04-01-002
Defence Policy on LCCA

• Defence Policy requires that LCCA must be conducted throughout the Materiel System life cycle, commensurate with the cost of ownership and potential opportunities for savings.

• Those performing or managing LCCA activities must use endorsed LCC tools.

• The methodology, results and decisions that arise from LCCA must be documented and maintained to facilitate ongoing analysis and ensure traceability.

DEFLOGMAN Part 2, Volume 10, Chapter 16 Defence Policy on Life Cycle Costing Analysis

Relationship between LSA, RAM, & LCCA

Source: DMH (LOG) 04-01-002, P71
Level of Repair Analysis (LORA)

- Support analysis includes Level of Repair Analysis (LORA) which determines, from a design and cost perspective:
  - which components should be repaired or replaced; and
  - optimum repair arrangements for those classified as Repairable Items (RIs).

Source: DMH (LOG) 04-01-002
Logistics Support Analysis Report (LSAR)

Output of LSA – The LSA Report

• The outputs of LSA and related analyses are recorded in the Logistic Supportability Analysis Report (LSAR).
• Areas of LSA activity captured in the LSAR include:
  – LCCA
  – Reliability, Availability, Maintainability and Testability
  – Failure Modes, Effects and Criticality Analysis (FMECA)
  – Maintenance Requirements Determination (MRD)
  – Spares Optimisation

Source: DMH (LOG) 04-01-002
DMSP (LOG) 04-0-004
Key Logistics Artefacts

Support Concept is the basis for defining the Support System for a Mission System. The Support System will use or interface with existing support infrastructure (FIC).

**Key Concepts**

- **Defence Capability**
- **Operational Concept**
- **Support Concept**
- **OCD (Defence)**

**FIC**

<table>
<thead>
<tr>
<th>Major Systems</th>
<th>Collective Training</th>
<th>Personnel</th>
<th>Support</th>
<th>Facilities / Training Areas</th>
<th>Supplies</th>
<th>Command &amp; Management</th>
<th>Industry</th>
</tr>
</thead>
</table>

**Materiel System to be acquired**

- **Mission System Requirements**
- **Support System Requirements**

**Contractor delivered System**

- **System Specifications**
- **Support System Specifications**

** FPS (Defence)**

**Contractor Specifications**
Support Concept

Support Concept – what is it?

• Describes a Support System, including its goals, functions, organisations, processes and resources.

• Documents the concepts for Through-Life Support (TLS) of the proposed capability once it enters service.

• Considers the Mission System(s) being supported, the associated Supportability characteristics, what the Support System must do, support objectives, environment, existing support infrastructure, and constraints.

• Should be agreed by affected stakeholders.

Source: DMM (LOG) 04-0-001
Support Concept – when is it developed?

- Is documented as part of the OCD or as part of a Description of Requirement (DOR).
- It may be an annex to the OCD but must be integrated into the OCD for the purposes of Solicitation and approvals.
- The Support Concept is developed progressively in support of the capability-definition and acquisition processes through the CLC.
- The Support Concept evolves and becomes more refined as the Project progresses.

Support Concept – what does it inform?

- Informs Acquisition and Support Contract strategies and is used in transition planning
- Is used to refine and help scope the ILS Plans, cost estimates, specifications (such as the FPS), and V&V requirements in the TEMP.
- For each Materiel System, the Support Concept will be unique, but will contain elements that are common with other Support Concepts and so should inform coordination with and use of existing support infrastructure in both Defence and Defence industry.
Support Concept - development steps

- The activities required to develop the Support Concept:
  - analyse Mission Systems and characteristics, which includes identifying, considering and recording Supportability-related factors;
  - identify likely Component Classes of the Mission System (ie sub-system categories) which will help identify the full scope of the Support System
  - outline Support System framework using the Support Systems Constituent Capabilities (SSCCs)
  - outline support for Component Classes (note, each solution-class must be assessed individually, although a common basis can be used);
  - …

The term, ‘Component Classes’ means the components of a Mission System that are of a similar type and that have similar or common support demands (e.g., diesel engines).
Support Concept – analyses and methods

- Support Concepts can be developed using a range of specific support analysis tools such as: LSA; LORA; RAM; FELSA; and LCCA.
- Support Concepts development can also be assisted through modelling and simulation to understand gross support functions and resources.

Support Concept development

Section 5: Constituent Logistics Support Capabilities
- Operating Support
- Engineering Support
- Maintenance Support
- Supply Support
- Training Support

Section 6: FIC
- Organisation
- Command and Management
- Collective Training
- Personnel
- Major Systems
- Facilities and Training Areas
- Supplies
- Support
- Industry

What and Why
- JCNS
- OCD
- ILS Concept

How
- PES
- IPMP
- ILSP

OCD Materiel System Support Concepts and Requirements. The support aspects are likely to be different for each Solution-class so the OCD should address each of ILSC for each class.
Simulation and Modelling for Support Concepts

Modelling and Simulation

• A model is: a simplified representation of a system:
  – real system
  – proposed system
  – futuristic system design
  – past system
  – phenomenon

• A simulation is an experimentation with a model of a system as it progresses through time, for the purpose of better understanding and/or improving that system.
Benefits of Modelling & Simulation

- Gain insight into the operation of a system.
- Develop operating or resource policies to improve system performance.
- Test new concepts and/or systems before implementation.
- Gain information without disturbing the actual system.

Benefits of System Dynamics Modelling

- Based on a target outcome can identify combinations of input parameters to achieve the desired outcome.
- Can use the various possibilities of inputs to undertake trade-off analyses to consider different options.
- Can adopt a structured approach to identifying constraining factors and provide focus for their treatment (theory of constraints).
- Can conduct sensitivity analysis and ‘what ifs’.
The Capability Life Cycle (CLC) and Capability Management Practices

Understanding the Support System

The power of two methodologies

Discrete Event Simulation (DES)
- Bottom up
- Models support activities
- Tactical view
- Simulations of physical solutions
- Data-driven
- State-based, captures events
- Tool: eg FlexSim

System Dynamics (SD)
- Top Down
- Models enterprise level ie systems view, captures interdependencies
- Strategic view
  - informs Support Concept options and Support System needs and requirements
  - informs tradeoffs and optimisation
- Quick results
- Stocks and flows
- Tool: eg AnyLogic

The methodologies are complementary

Defining Support System Needs and Requirements

The power of two methodologies

Discrete Event Simulation (DES)

System Dynamics (SD)

- Needs
  - Operational Concept (OCD)
- Logistics Support Concept (LSC)

- Requirements
  - Function and Performance Specification (FPS)
  - Support System Specification (SSS)

- Systems Dynamics provides needs-level ‘drivers’ which reflect optimisation of enterprise objectives.
- DES enables definition of support system requirements and solution specifications which reflects implementation.
The Capability Life Cycle (CLC) and Capability Management Practices

Modelling for Force Design

Design a fleet management variant
- Acquisition and retirement decisions
- Operational requirements
- Loss and failure risks
- Lifetime extension and upgrade programs
- Maintenance activities and resources

Run the model
The Capability Life Cycle (CLC) and Capability Management Practices

Modelling for Force Design

Design and compare different variants

UNCLASSIFIED
### The Capability Life Cycle (CLC) and Capability Management Practices

**Figure 1:**

**DUMMY DATA - EXAMPLE ONLY**

<table>
<thead>
<tr>
<th>Submarine</th>
<th>Simulation - AnyLogic University [PUBLIC RESEARCH USE ONLY]</th>
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</thead>
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**Figure 2:**

<table>
<thead>
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<th>Dummy Data - Example Only</th>
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**UNCLASSIFIED**
The Capability Life Cycle (CLC) and Capability Management Practices

LCCA

Lifetime extension decision
The Capability Life Cycle (CLC) and Capability Management Practices

LCCA

Effect on acquisition of boosting of the fleet condition

Trade-off analysis

Average Achieved Flying Hours
Trade-off analysis

Invest in new maintenance line vs buying a new aircraft

No performance difference between 13 and 14 aircrafts

ILS Plan
ILS Plan (ILSP)

• The Support Concept is used as a basis to develop the Project ILSP.

• The ILSP details how the Support Concepts are to be realised and further details responsibilities for implementing aspects of the proposed Support System.

• The ILS planning process, is a fundamental Defence requirement for the acquisition and sustainment management functions in the delivery of Capability Support.

ILS Plan (ILSP)

• ILSP is first drafted before Industry is engaged through an Invitation To Register (ITR), Request For Proposal (RFP) or Request For Tender (RFT), to ensure that sustainment is adequately addressed within solicitation documents.

• The responses from Industry are used to further develop the draft plan for approval prior to contract signature.

• Once approved, the ILSP remains a 'living' document to provide the ILS management 'roadmap' for the project.
ILS Plan (ILSP)

- The ILSP defines the objectives of the ILS program and assigns broad tasking / responsibilities towards achieving these.
- ILSP is used by the ILS Manager (ILSM) and ILS Team to document and manage the ILS activities to be undertaken by both Defence and Contractor.

The ILSP should detail:

- Supportability aspects of the Materiel System to be acquired.
- Objectives and goals of the ILS Program.
- Organisation and responsibilities for the ILS Program.
- Methodologies for conducting and managing all ILS activities.
- ILS program WBS and schedule.
- Stakeholders.
- How all the activities will be managed, controlled, scheduled, funded and the allocation of tasks and responsibilities.
- Evaluation activities to validate the accuracy and adequacy of the logistics support.
The Capability Life Cycle (CLC) and Capability Management Practices

**ILS Plan – LSA Program**

- Projects often engage prime contractors to perform Supportability Analysis (SA) and related ILS tasks
- The Contractor’s ILS Plan (called an Integrated Support Plan (ISP) forms a sub-set of the Project’s ILSP.
- The ILSP should describe the LSA program, covering:
  - the opportunities to influence the design of the mission and support system,
  - the scope and LSA strategy, and
  - the tools which will be used to assist in the analysis.

**ILS Plan (ILSP)**

- The ILSP details how the Project Office (PO) ILS Team will:
  - analyse the FIC;
  - define the support solution for solicitation; and
  - deliver the Materiel System support (Support System) including the support element resources and services for sustainment.
- The ILSP should outline the various ILS program activities and the workforce required.
- The ILSP details how each of the defined Support System Constituent Capabilities (SSCC) will be resourced.
**Day 4: Procurement & Contracting**

- Legislative and Policy context
- Core Principles
- Procurement and Contracting: Managing Risk
- Procurement-related Delegations
- Method of Procurement, Approach to Market & Delivery Model
- Smart Buyer
- Implementing procurement and contracting
  - Procurement life cycle
  - Contracting Templates
    - Tailoring, Content

**Procurement & Contracting: why it matters**

- Procurement and Contracting activities are where the ‘upstream’ activities of Force Design, Risk Mitigation and Requirements culminate in the acquisition and sustainment of capability.
- As stated in the Interim CLC Manual (Para 1.4b) of the Risk Mitigation and Requirement Setting Phase:

  “The primary output of this phase is a firm contractable proposition to acquire and sustain the Product, which forms the core of the Gate 2 Business Case.”
Procurement and Contracting

- In FY 2014-15 the Commonwealth procured goods and services worth $59.4 billion through 69,236 contracts above $10,000.
- Defence and CASG procurements accounted for approximately 52% of the value of these contracts.
- During this period, the then DMO entered into contracts with a total combined value of $11.9 billion to provide safe, quality and fit-for-purpose equipment for use by the Australian Defence Force (ADF).

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
Procurement and Contracting

- Capability management and the CLC is critically dependent on sound procurement and contracting practices.
- In order to maximise the return on its procurement investment the Government expects that Defence will deliver and sustain required capabilities to high quality standards, at optimum cost and within agreed schedules.
- It is also expected that the procurement practices are properly matched to the level of risk and complexity in order to reduce the cost of tendering and contract management for both Defence and industry.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
Resource management framework

- The Commonwealth Resource Management Framework governs how officials in the Commonwealth public sector use and manage public resources.
- Defence operates within the Commonwealth resource management framework.
- The resource framework is part of the broader Commonwealth legislative and policy environment, and consists of the legislation and policy (including the CPR) governing management of the Commonwealth’s resources.
- The cornerstone of the framework is the PGPA Act.

Resource management framework

- The PGPA Act authorises the Secretary, as Defence’s Accountable Authority, to issue Accountable Authority Instructions (AAI) (PGPA Act, section 20A) which provide internal instruction for Defence.
- The PGPA Act also contains provisions dealing with:
  - commitment of relevant money and officials entering into arrangements such as contracts and deeds (PGPA Act, section 23).
  - indemnities, warranties and guarantees (‘contingent liabilities’) (PGPA Act Section 60)
- Sections 23 and 60 of the PGPA Act are key provisions relating to procurement.
Defence Proc & Contracting Policy Context

- Defence and its officials also operate in an environment of broader legislation and policy:
  - **Commonwealth, State and Territory legislation:** such as the PGPA.
  - **Commonwealth Policy:** such as CPR.
  - **Defence Policy:** Defence Procurement Policy Manual (DPPM) and Defence Procurement Policy Directives.

- In many cases legislation and policy affects Defence procurement which is given effect to through contracts.

Source: DPPM April 2017
Legislation: PGPA Act 2013

- The PGPA Framework requires Defence officials to:
  - not be inconsistent with the policies of the Australian Government;
  - use and manage public resources in an efficient, effective, economical and ethical manner;
  - exercise ‘care and diligence’ in performing their duties;
  - “Act honestly, in good faith and for a proper purpose” performing their duties;
  - not improperly use their position in performing their duties;
  - not improperly use information; and
  - disclose interests in relation to the performance of their duties.

Source: DPPM April 2017 Paragraph 21

Commonwealth Procurement Rules

- Commonwealth Procurement Rules (CPRs):
  - have effect under the PGPA Act 2013;
  - set out the rules that officials must comply with when they procure goods and services;
  - indicate good practice;
  - are the keystone of the Government’s procurement policy framework; and
  - achieving value for money is the core rule.
Defence Procurement Policy Manual

- Defence Procurement Policy is laid out in the DPPM:
  - a framework that promotes responsible and accountable spending by Defence officials when procuring goods and services for Defence;
  - provides primary operational instructions to Defence officials in carrying out their duties related to procurement, tailored to Defence’s particular circumstances and needs; and
  - incorporates CPR and additional Defence Procurement Policy Directives that must be complied with by Defence officials in relation to procurement.

Source: DPPM April 2017

Defence Procurement Policy Manual

- DPPM applies to all Defence officials.
- In addition, a contract may extend the application of this manual to a contractor, or a contractor may be prescribed to be a Defence official in accordance with Defence’s Accountable Authority Instructions.
- Defence Procurement Policy Directives supplement specific CPRs in the context of the particular circumstances and needs of the Defence.

Source: DPPM April 2017
Purpose of CPR and DPPM

• The CPR and Defence Procurement Policy Directives in the DPPM exist to assist Defence officials make proper use of public resources when undertaking procurement related activities for the Commonwealth. Defence officials, like officials from other Commonwealth agencies, are accountable for how they spend relevant money (also known as ‘public money’).

• The DPPM provides a framework that promotes responsible and accountable spending by Defence officials when procuring goods and services for Defence. This framework supports the proactive management of the risks relating to procurement, as required by the CPR.

Source: DPPM April 2017 Paragraph 34 and 35

Purpose of DPPM

• The purpose of the DPPM is to inter alia:
  – Assist Defence officials to comply with the CPRs and Defence policy when undertaking procurement.
  – Encourage officials to adopt more strategic approaches, commercial expertise and good practice when procuring for Defence.
  – Encourage officials to engage early with Defence industry to stimulate competition and innovation and work with industry to develop better solutions and outcomes for Defence.

Source: DPPM April 2017
Compliance with DPPM, CPRs, Directives

- Officials are not permitted to depart from the mandatory requirements of the PGPA Act, CPR, AAI and FINMAN 2.
- If a Defence official departs from the DPPM in a way that results in a departure from the CPRs, then the official will have contravened the law.
- When considering a possible departure from a Defence Procurement Policy Directive contained in the DPPM, Defence officials should:
  - consider if reasonable and justified
  - consult their supervisor
  - be responsible and accountable for the consequences

Contractors and DPPM, CPRs, Directives

- Defence officials should consider whether contractors should be required to comply with the DPPM when undertaking procurement on behalf of Defence and communicate this requirement to the contractors, including the incorporation of appropriate provisions in contracts.
- For more information about when it might be appropriate to require contractors to comply with the DPPM, see paragraph 4.15 of the CPRs and the related Note.
- Defence is always under an obligation to ensure that its procurement activities (whether outsourced or not) deliver value for money to the Commonwealth.

Source: DPPM
Procurement: Core Principles

CPR Core Principles

- The CPRs have some core principles that Defence officials need to consider when planning and undertaking their procurement activities:
  - Value for Money
  - Competition
  - Non-discrimination
  - Ethical Behaviour: the balance between probity and industry engagement
  - Risk Management
Value for Money

• ‘Value for Money’ is the core requirement of Commonwealth procurement.

• Procurements should:
  – encourage competition and be non-discriminatory;
  – use public resources in an efficient, effective, economical and ethical manner that is not inconsistent with the policies of the Commonwealth;
  – facilitate accountable and transparent decision making;
  – encourage appropriate engagement with risk; and
  – be commensurate with the scale and scope of the business requirement.

Source: DPPM Chapter 2

Value for Money

• Value for money does not automatically mean the lowest price goods or services.

• Must consider the relevant financial and non-financial costs and benefits of each submission, including matters such as:
  – the quality of the goods and services;
  – fitness for purpose of the proposal;
  – the potential supplier’s relevant experience and performance history;
  – flexibility of the proposal (including innovation and adaptability over the life cycle of the procurement);
  – environmental sustainability of the proposed goods and services (such as energy efficiency and environmental impact); and
  – whole-of-life costs.

Source: DPPM Chapter 2
The Capability Life Cycle (CLC) and Capability Management Practices

Competition

- Competition is a key element of the Australian Government's procurement framework.
- A competitive procurement process is normally the means by which Defence ensures that it is receiving value for money.
- Competition is important because it is most effective motivator for industry to reduce costs and improve performance.
- Competition does not necessarily mean an open tender. Any process involving more than one supplier will be competitive.
- If an open competition is not feasible, Defence officials should explore opportunities for a limited competition subject to relevant CPR.

Source: DPPM Chapter 2

Non-discrimination

- Effective competition also requires non-discrimination meaning Defence is normally unable to require in its request documentation that particular work be done in Australia, or done by Australian based suppliers, or that suppliers use Australian materials.
- Specific exemptions can be sought from the non-discrimination principle in appropriate cases (for example, through a measure under paragraph 2.6 of the CPR), or through other mechanisms such as the Australian Industry Capability (AIC) policy, or other specific Government policy decisions.
- Exemptions are most likely to be found in major capital equipment acquisition decisions (for example, naval shipbuilding).

Source: DPPM Chapter 2
Ethical Behaviour

• Section 6 of the CPRs sets out the requirement for Defence officials to properly use and manage public resources.

• ‘Proper’ means:
  – **Efficient**: achievement of the maximum value for the resources used incl selection of the procurement method.
  – **Effective**: extent to which intended outcomes or results are achieved incl price, quality and quantity, and the degree to which these contribute to specified outcomes.
  – **Economical**: minimising cost, avoiding waste.
  – **Ethical**: honesty, integrity, probity, diligence, fairness and consistency incl identifying and manages conflicts of interests, not making improper use of an individual’s position.

Source: DPPM Chapters 2 and 4, Source: CPRs 6.1-6.5

Ethical Behaviour

• Officials undertaking procurement must act ethically throughout the procurement including:
  – recognising and dealing with actual, potential and perceived conflicts of interest;
  – dealing with potential suppliers, tenderers and suppliers equitably, including by:
    • seeking appropriate internal or external advice when probity issues arise, and
    • not accepting inappropriate gifts or hospitality;
  – carefully considering the use of public resources; and
  – complying with all directions, including relevant entity requirements, in relation to gifts or hospitality, the Australian Privacy Principles of the Privacy Act 1988 and the security provisions of the Crimes Act 1914.

Source: CPR 6.6
Probity

• Attention to probity is integral to ensuring the defensibility, transparency and success of Defence procurements. Defence procurements, particularly those relating to major capital acquisitions, ICT projects and major facilities, are under increasing scrutiny by tenderers, the Australian National Audit Office, Senate Estimates and other Parliamentary Committees, and the media.

• Probity is the evidence of ethical behaviour, and can be defined as complete and confirmed integrity, uprightness and honesty in a particular process. The Department of Finance website lists a number of principles which underpin ethics and probity in Australian Government procurement.

*Source: DPPM para 66 and 67

Probity

• The legislative and policy obligations related to probity include:
  – general duties of officials in Sects 25 to 29 of PGPA Act (due care, diligence, good faith, declaring interests etc);
  – the APS Values and APS Code of Conduct (see Public Service Act 1999, sections 10 and 13);
  – Defence Instruction (General) PERS 25-4 - Notification of Post Separation Employment;
  – Defence Instruction (General) PERS 25-6 - Conflicts of Interest and declarations of interests; and
  – Defence Instruction (General) - PERS 25-7 - Gifts, Hospitality and Sponsorship.

Source: DPPM Chapter 2
Commercial Acumen

- Essentially, Commercial Acumen means:
  - having an appropriate understanding of how industry is and can be used in Defence business;
  - understanding the commercial drivers of industry;
  - how to engage with industry and manage commercial relationships and services; and
  - dealing appropriately with potential suppliers, tenderers and suppliers.

- Effective engagement with and management of the business relationship between Defence and industry is a critical aspect of capability management.

Consistency with Government policies

- Section 21 of the PGPA Act requires the Secretary to govern Defence in a way that is 'not inconsistent with the policies of the Australian Government'.

- This can include Cabinet decisions, or other Government approvals relating to a commitment of relevant money, to the extent that the decision or approval establishes a course or line of action.

- Defence officials exercising delegations (especially those for the purposes of section 23 of the PGPA Act) should ensure that they do so consistent with the terms of any Australian Government decisions or approvals relevant to the procurement.
Risk Management

Procurement Risk

- Consistent with CLC a risk-based approach to Defence procurement and contracting is required
- Depending on the nature of the procurement, risks that may need to be considered include: technical, operational, industrial, managerial, work health and safety, financial, legal, commercial, or probity risks.
- Risks need to be considered across the procurement life cycle:
  - risk identification and management in the planning stage of the procurement life cycle;
  - risk assessment during the tender evaluation stage

Source: CPR 8.4 DPPM
Risk Allocation

• As a general principle:
  – risks should be borne by the party best placed to manage them
  – relevant entities should generally not accept risk which another party is better placed to manage.
  – when a relevant entity is best placed to manage a particular risk, it should not seek to inappropriately transfer that risk to the supplier.

• The endorsed Defence contracting templates set out the standard Defence approach to risk allocation between the Commonwealth and its contractors

Source: CPR 8.4 DPPM

Risk: Defence Directives

• For all procurements at or above the relevant procurement threshold, Defence officials must:
  – undertake a risk assessment so that they are properly informed about the risks associated with the procurement;
  – subject to the risk assessment, develop and implement a risk management plan to manage the risks; and
  – Defence officials must undertake a liability risk assessment prior to agreeing to limit a third party’s liability under a contract.

Source: Defence Procurement Policy Directives, DPPM
Smart Buyer ‘Risk and Drivers’ categories

- **Acquisition**
  - Requirements
  - Technology
  - Schedule
  - Commercial
  - Project Integration
  - Defence Integration
  - Financial
  - Strategic
  - Industry

- **Sustainment**
  - In-Service Requirements
  - Obsolescence
  - Commercial
  - FIC
  - Financial
  - Strategic
  - Operational
  - Industry

For each Project/Proposal these are rated as High, Medium-High, Medium-Low or Low

Procurement-related Delegations
System of Delegations

• A delegation is conferred on or delegated to the Secretary of the Department of Defence under the PGPA Act in relation to procurement.

• Defence implements a corresponding system of delegations which essentially confers authority on others in the organisation so that they, in turn, can exercise a power to take an action and/or make certain decisions.

• For a Defence official (including a contractor who is prescribed as a Defence official) to exercise a power they are required to have the delegated authority. These delegations are described in the Defence Accountable Authority Instructions (AAIs) and issued in Financial Delegations Manual (FINMAN 2).

Reasons for delegations in procurement

• In support of Procurement and Contracting activities, Defence has in place delegations to:
  – provide authority to Defence officials to spend money or undertake actions within certain limits;
  – ensure that these activities represent efficient, effective, economical and ethical use of public resources; and
  – provides a risk-based approach to enabling decision-making across Defence with suitable controls.
Procurement and Contracting Delegations

- Under PGPA Act, delegations applying to procurement are:
  - Commitment Approval (being able to commit public funds to an activity).
  - Enter into an Arrangement (enter into a ‘contract’ including paid contracts, standing offers, non-financial arrangements).
- In addition Defence officials are required to obtain an ‘Endorsement to Proceed’ (EtP) before undertaking certain procurements.
- The EtP process is part of Defence’s internal controls to better ensure the proper use and management of public resources.

Sequence of exercising Delegations

- For the purposes of section 23(3) of the PGPA Act, delegated Defence officials may approve the commitment of relevant money (Commitment Approval delegation).
- This delegation is to be exercised before the Commonwealth enters into the arrangement that commits money.
- For the purposes of section 23(1) Defence officials may also enter into an arrangement on behalf of the Commonwealth (Enter into an Arrangement delegation) which is approved by a Commitment Approval Delegate.
- Defence officials exercise Enter into an Arrangement delegation by the physical act of, for example, signing a contract.
Applicability of Section 23 delegations

• Section 23 PGPA Act delegations apply to all kinds of procurements:
  – both delegations need to be exercised when Defence is establishing a standing offer arrangement (which is usually established by way of a deed). Similarly, both delegations will be required for each order placed under a standing offer arrangement.
  – change to a contract (contract change, amendment or variation etc) may constitute a procurement in which both delegations will need to be exercised for each contract change, if the change involves the commitment of relevant money.
  – ...

• If the contract change does not involve the commitment of relevant money (that is, it is a ‘nil-cost’ contract change), only the Enter into an Arrangement delegation is required (but the delegates should be satisfied that the proposed change represents proper use and management of public resources and is not inconsistent with the policies of the Australian Government).
Method of Procurement, Approach to Market and Delivery Model

Method of Procurement

• Under the CPRs, there are two main procurement methods:
  – Open tender – where Defence approaches the open market and invites submissions.
  – Limited tender - where Defence approaches only one or more potential suppliers to make submissions.
• Identifying the procurement method will determine which rules apply.
• Under the CPR, the default position is open tender.
• Limited tender includes only one supplier (often called a ‘sole source’ procurement).
Method of Procurement

- Selection of a procurement method, either open or limited tender, is dependent on:
  - the nature and structure of the market;
  - the extent of competition (that is, the number of genuinely competitive suppliers); and
  - schedule, cost or other constraints (for example, intellectual property, security etc).
- Very limited circumstances for a limited tender (CPR 10.3):
  - reasons of extreme urgency;
  - unsolicited innovative proposals;
  - no real alternative (such as absence of competition for technical reasons); and
  - additional deliveries of compatible goods and services.

Method of Procurement

- In deciding on the procurement method for a procurement, Defence officials must ensure:
  - that the method is commensurate with the scope, scale, and risk of the procurement and is consistent with value for money; and
  - all procurement method decisions are appropriately documented.
- For procurements valued at or above $200,000, the EtP template is normally the mechanism by which procurement method decisions are documented.
- The Commitment Approval delegate (see section 23(3) of the PGPA Act) would also confirm the procurement method decision as part of the exercise of their delegation.
Value and Method of Procurement

- Defence has a structured approach to procurement methods in which the expected value of a procurement will drive the method of procurement.
- The expected value is the maximum value of the proposed contract including: the value of the goods and services being procured, options, extensions, renewals, etc over the life of the contract.
- When a procurement is to be conducted in multiple parts the expected value is the maximum value of all of the contracts.

Source: DPPM CPR 9.2 – 9.7

Approach to Market

- The type of approach to market includes:
  - request for tender (RFT),
  - request for proposal (RFP),
  - request for quote (RFQ) under a standing offer panel
  - competitive evaluation,
  - some other form of iterative engagement process, and
  - other form of documentation
- The categorisation of a procurement as open or limited tender does not determine what approach to market to use.
- Defence officials should determine the appropriate approach to market strategy during the planning stage of the procurement.
Project Delivery Model

- The project delivery model can include prime contract, managing contractor, design and construct contract, alliance contract etc.
- The categorisation of a procurement as an open tender or limited tender does not determine what approach to market to use.
- Defence officials should determine the appropriate approach to market strategy and project delivery model during the planning stage of the procurement.

Procurement Thresholds and Contracting

- The means by which to contract is also dependent on the value, risk, and complexity of the procurement:
  - **Under $10,000:** Defence Purchasing Card (except for MILIS).
  - **Under $200,000:** Commonwealth Contracting Suite or if exempt, an endorsed Defence contracting template.
  - **Between $200,000 and $1 million:** an endorsed Defence contracting template.
  - **Above $1 million:** an endorsed Defence contracting template for the type of procurement being undertaken.
  - **US Foreign Military Sales (FMS):** Use FMS ‘cases’.
Smart Buyer

SmartBuyer: integrates procurement factors

- Smart Buyer brings together:
  - CPR Core Principles
  - risk management
  - selecting the method of procurement
  - how to approach the market
  - deciding delivery method
Smart Buyer

• Smart Buyer is a decision-making framework that supports the development of the:
  – Business Case, and
  – PES
  – Recommendation on Approval Process/Strategy
• Two step process
  – Risk and drivers analysis
  – Tailored strategy development

Source: Smart Buyer Kick-off Meeting Pack

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Smart Buyer: Risks & Drivers to Strategies

![Diagram](https://example.com/smart-buyer-diagram.png)

Source: DepSec CASG Smart Buyer Presentation
The Capability Life Cycle (CLC) and Capability Management Practices

Smart Buyer Products

- **Risk and drivers analysis:**
  - Explanation of risk, drivers, actions
  - ‘Heat Map of risk ratings across risk categories

- **Tailored strategies across:**
  - Acquisition Strategy
  - Sustainment Strategy
  - Approval Strategy eg
    - Approval pathway (Gate 1 & 2, Combined, Multiple Gate)

- **PES document**

  Source: Smart Buyer Kick-off Meeting Pack

Smart Buyer – implementation steps

- **Process steps (scalable)**
  - Kick-Off meeting (1.5 hrs)
  - Risk and Drivers workshop (1 day)
  - Strategy Development workshop (1 day)
  - Project team drafts the PES
  - Red Team Review (1.5 hrs)
  - Approval by Delivery Group Div or Branch Head

- Facilitated and supported using members of the CASG Independent Assurance Review team who are independent and possess significant experience.

  Source: Smart Buyer Kick-off Meeting Pack
Implementing Defence Procurement & Contracting

Implementing Procurement

“Good procurement practice is not about just mechanically applying the CPRs or the additional Defence Procurement Policy Directives in the DPPM. It is about developing a strong understanding of all aspects of the procurement life cycle and using judgement to apply this understanding in each case to deliver the best outcomes. While Defence officials need to comply with the CPRs and the DPPM, officials should design each procurement process in a way that is commensurate with the scope, scale and risk of the relevant procurement.”

Source: DPPM para 90
The Capability Life Cycle (CLC) and Capability Management Practices

Procurement Life Cycle

• The Procurement Life Cycle is scalable and tailorable. In its most general form it is divided into three phases and seven distinct but interrelated stages:
  – Planning
    • 1. Plan the procurement
    • 2. Develop ‘Request documentation’ eg RFT
  – Sourcing
    • 3. Approach the market
    • 4. Evaluation
    • 5. Negotiation and contract signature
  – Managing
    • 6. Contract management
    • 7. Disposal

Source: DPPM

Relationship to CLC

• The CLC reflects the procurement life cycle for a major acquisition ie planning through defining the requirement and selecting the acquisition strategy through to solicitation and disposal.

• Procurement for activities can also be nested within the CLC which also reflect the procurement life cycle—for example, acquiring risk mitigation studies or other services.
Procurement Plan

• The Procurement Plan will normally cover the following:
  – a description of the procurement;
  – the procurement method to be used (for example, open tender, limited tender), including reasons;
  – proposed probity arrangements;
  – proposed governance arrangements, such as the need for a steering committee;
  – the procurement risk assessment; and
  – indicative time-lines and resources (including budgeting of funds to support the procurement).

Source: DPPM April 2017 Paras 96

Procurement Plan

• Level of detail in the procurement plan should reflect the scope, scale and risk of the procurement.
• For less complex procurements, the EtP document may be sufficient to serve as the procurement plan.
• For procurements that are required to be considered by the IC (for example, Major Capital Equipment, and major ICT and infrastructure procurements), the procurement plan will be informed by the Smart Buyer PES.

Source: DPPM April 2017 Para 97
Request Documentation

- The request documentation sets out the rules for the procurement.
- It describes to potential suppliers, the specifics of the procurement, the manner in which submissions are to be forwarded to Defence (for instance, through AusTender) and how submissions will be evaluated.
- The request documentation will usually be the primary information source used by potential suppliers when developing a submission.

DPPM: Paras 98 and 99

Request Documentation

- Request documentation will normally include:
  - description of the requirement (for example, the SOW), including any essential requirements;
  - any conditions for participation or minimum content and format requirements;
  - evaluation criteria and methodology;
  - the other rules of the process; and
  - the draft contract.
**Statement of Work (SOW)**

- The SOW should describe:
  - nature, scope and quantity of the goods and services required;
  - requirements including certification, T&E, plans, drawings and training materials;
  - applicable technical specifications (function and performance requirements, rather than specific designs or product descriptions) and related standards;
  - ‘essential requirements’ (in which case, if suppliers are not able to meet the requirements, they will be excluded from consideration); and
  - timeframes expected for the delivery of the required goods, works or services.

**Conditions for participation**

- Mandatory minimum requirements for supplier submissions to be considered.
- Defence officials should take great care when deciding whether to include conditions for participation and what these might be, as the CPR require that Defence reject any submission that does not meet the conditions for participation.
- Conditions for participation are limited to those assuring the legal, financial, technical or commercial capabilities of the supplier to meet the particular requirements of the procurement.
Evaluation Criteria

- Evaluation Criteria set the foundation for a fair and equitable assessment of submissions.
- Definition of criteria on the nature of the particular procurement.
- Evaluation of tenderers should be based on a balance of all the criteria, or if a weighting methodology is used, on the relative importance of each criterion.
- If a weighting methodology is used, Defence officials should consider setting this out in the request documentation so that potential suppliers can appropriately focus their responses.

Rules of the Process

- The request documentation should also set out the rules around:
  - lodgement of submissions: AusTender or other and closing time for submissions; and
  - answering questions and distributing responses as part of Defence officials responsibilities to be available to answer queries during the period that the tender is open.

DPPM: Paras 105, 106

DPPM: Paras 107, 108
Draft Contract

- Defence normally requires tenderers to indicate their compliance (or non-compliance) with a draft contract which contains the terms and conditions on which Defence is willing to enter into a contract for the requirement.
- Defence officials should assess the risk with the tenderers’ non-compliances with the draft contract to enable tenderers to be evaluated against a common baseline.

DPPM: Paras 109

Evaluation

- As part of any procurement Defence officials should develop and finalise an Evaluation Plan before an approach is made to the market
- Evaluation Plan is an internal Defence document that sets out the method for evaluating submissions
- Depending on complexity, evaluation organisation may use a steering committee, an evaluation board or team and subordinate evaluation working groups.
- Also may include internal or external advisers or experts to assist with technical requirements, financial viability or price.

DPPM: Para 111
Evaluation Report

- CPRs require Defence officials to maintain appropriate documentation of the decision making process for each procurement.
- The evaluation report will normally contain:
  - a summary of the evaluation process;
  - a summary of the assessment of each submission;
  - reasons for the exclusion of a submission from further consideration;
  - recommendations concerning the preferred tenderer(s) based on value for money; and
  - details of any issues which need resolution during subsequent contract negotiations.

DPPM: Paras 115-117

Notifying Tenderers

- CPRs require Defence officials to notify affected tenderers promptly of the evaluation outcomes and, if requested, provide a debrief to the tenderers (both successful and unsuccessful tenderers).
- A debrief (verbal or written) should include, as appropriate:
  - explanation of why submission successful or not;
  - areas of weakness or non-compliance in the offer;
  - suggestions for improving future submissions
  - if contract already successfully negotiated, the name of successful supplier and total contract price (AusTender in any event, if valued at or above $10,000).
- Defence officials should keep a written record of debriefing.

DPPM: Paras 119-120
Negotiation and Award of Contract

- Final stage of procurement process is negotiation and award of the contract with the preferred tenderer.
- During contract negotiations, Defence officials should seek to resolve any issues that were identified during the evaluation.
- At any time during the procurement process, Defence can determine that awarding a contract is not in the public interest but this is a serious step with potential legal and management risks.
- Public interest grounds generally arise in response to new information or unforeseen events.

DPPM: Paras 121-123

Contracting Templates
Contracting Templates

• Various contracting templates have been developed by Commonwealth entities to meet different procurement needs and profiles, depending on the size, complexity and nature of the procurement activity.

• These include:
  – Commonwealth Contracting Suite.
  – Defence Suite of Facilities Contracts

• The focus of the following sections is on ASDEFCON as utilised in Capability Management.

Contracting Templates

• Defence contracting templates are drafted and regularly updated to give effect to applicable Commonwealth legislation and policy (including the CPR) and Defence policy.

• If using an endorsed and appropriate Defence contracting template Defence officials may rely on the template as meeting applicable legislation and policy requirements.

• Commonwealth, State and Territory legislation and policy often affects procurement (such as contracting, legal, finance, environment, work health and safety, security, technical regulatory frameworks) therefore Defence officials should seek advice from relevant Defence policy and support areas

DPPM: p35, 36
ASDEFCON templates

- Defence procurement is supported by the standardised templates provided under the ASDEFCON suite of tendering and contracting templates. ASDEFCON translates mandatory procurement policy requirements into an appropriate contractual form.
- Most ASDEFCON templates include:
  - a covering letter to tenderers,
  - conditions of tender with response volumes,
  - a draft contract and where appropriate, and
  - a draft statement of work (SOW).
- Associated handbooks and related training are available for some templates.

Source: Department of Defence Website: Doing Business with Defence

Objective of ASDEFCON templates

- The objectives of ASDEFCON include, inter alia:
  - Engender professionalism of Defence staff.
  - Support efficiencies by facilitating RFT and contract development and management.
  - Standardise and benchmark Defence's business practices and procedures that:
    • support Commonwealth and Defence policies;
    • reflect 'best practice'; and
    • provide framework for VFM and accountability.
  - Improve relationships with industry by engaging in developing and enhancing tendering & contracting templates.
  - Lead contracting reform in Defence.

Source: Department of Defence Website: Doing Business with Defence
Tailoring of ASDEFCON templates

• Defence staff and external agencies using ASDEFCON templates are expected to select and tailor the template(s) appropriate to procurement requirements (seeking appropriate professional guidance as required).

• Selecting the right contract template is integral to maximising Defence return on its procurement investment.

• Defence has issued a Contract Template Selection and Tailoring Guide for which basic principle of template selection is ‘best fit’ SOW for the procurement’s scope of work.

Source: Department of Defence Website: Doing Business with Defence
Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

ASDEFCON template selection

• Objectives of ASDEFCON template selection and tailoring are to:
  – enable best value for money to be obtained
  – ensure sound governance and accountability
  – achieve a sensible balance between technical, contractual and managerial risks

• Work requirement as defined in the SOW drives template selection.

• SOW captures the scope of work including the ‘technical requirements’ and therefore a significant driver of the complexity and overall risks of the procurement.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
The Capability Life Cycle (CLC) and Capability Management Practices

Pivotal role of SOW in selection

- The SOW details the work required to be done by both parties during the contract.
- Unnecessary work requirements will increase cost without a commensurate increase in value, while insufficient work especially in regard to technical risk may jeopardise outcomes, both resulting in reduced value for money.
- Before selecting a contracting template it is essential to understand the nature of the activity and the goods and/or services to be acquired ie materiel or a non-materiel and if it is a procurement or agreement to hire, loan, sale or gift a Defence asset.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

Five steps in template selection

- **Step 1**: is it a procurement or disposal/transfer of asset; is it a materiel or non-materiel procurement.
- **Step 2**: identifies likely template for a materiel procurement.
- **Step 3**: describes steps for tailoring ASDEFCON templates.
- **Step 4**: describes the options for non-materiel procurements using ASDEFCON, other Defence and Commonwealth templates, and standing offers / panels.
- **Step 5**: describes templates for the disposal or temporary transfer of Defence Assets.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
The Capability Life Cycle (CLC) and Capability Management Practices

Step 1

• Determine:
  – Procurement or disposal/transfer of asset?
  – Materiel or non-materiel procurement?

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

Materiel Procurement

• Materiel procurements include goods and services for ‘military purposes’.
• ‘Goods’ include major platforms, such as ships, vehicles and aircraft through to consumables, such as oil, and nuts and bolts used on materiel systems.
• ‘Services’ related to materiel include services applied directly (‘physically’) to the materiel eg maintenance and supply activities (‘Materiel Support Services’), and services that are otherwise ‘related’ to the materiel, such as reliability analysis, maintenance or inventory requirements determination (‘Indirect Materiel Services’).

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
Non-Materiel Procurement

- Non-materiel procurements include all other goods and services, such as infrastructure, commercial ICT goods and services, office supplies, domestic trade services, gardening, food, printing services, consultancy services not related to materiel systems etc.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

Step 2: Identify likely template for materiel

- Select a template from the range available.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
**Range of ASDEFCON templates**

- **Simple** Procurement of Goods and Repair / Maintenance Services Procurement or disposal/transfer of asset;
- **Materiel Acquisition**: selection of appropriate Materiel Acquisition Templates:
  - ASDEFCON (Strategic Materiel)
  - ASDEFCON (Complex Materiel) Volume 2
  - ASDEFCON (Complex Materiel) Volume 1
  - ASDEFCON Standing Offers
  - Simple Procurement of Goods

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
Range of ASDEFCON templates

- **Materiel Support**: Materiel Support Templates:
  - ASDEFCON (Support)
  - ASDEFCON (Support Short)
  - ASDEFCON Standing Offers
  - Simple Procurement of Repair / Maintenance Services

- **Linked and Combined Materiel Acquisition and Support Contracts**:
  - Most materiel acquisitions will require follow-on support for the materiel so be arranged in a single procurement
  - ASDEFCON Linkages Modules are designed to help ‘link’ draft contracts based on the ASDEFCON templates for acquisition and support released under a single RFT

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

ASDEFCON (Strategic Materiel) Template

- Applicable to large-scale design, development and integration projects, incl ‘system-of-systems’ integration.
- Typically for:
  - new systems (eg, platforms, vehicles or complex electronic systems) where no off-the-shelf solutions exist or are suitable
  - major development-based modernisation programs for existing systems

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
ASDEFCON (Strategic Materiel) Template

- Technical complexity reflecting a high-to-very high risk eg
  - incorporates evolving technology
  - software-intensive
  - complex systems-integration
  - ‘system-of-systems’ integration
- Governance and assurance mechanisms suitable for high levels of technical risk including project management and technical disciplines.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

ASDEFCON (Strategic Materiel) Template

- SE and ILS programs applied “in full” to the design and development of the new Materiel System (ie, Mission Systems and the Support System) over three or more years, prior to the start of production.
- ASDEFCON (Strategic Materiel) to be used for more complex major capital equipment developmental projects and require considerable project office and/or external support resources.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
ASDEFCON (Complex Materiel) Volume 2

• Applicable to medium risk design, development and integration projects, including some lower-complexity ‘system-of-systems’ integration and software development.

• For example:
  – major components of the solution might exist but significant effort required to integrate or develop new components and/or interfaces;
  – new subsystem integrated into a number of platforms, or existing off-the-shelf solutions which requires modifications to be interoperable with legacy systems
  – significant effort designing interface between the new and existing system components

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

ASDEFCON (Complex Materiel) Volume 2

• Lower level governance and assurance mechanisms suitable for medium levels of technical risk.

• Scaled-down SE and ILS programs where designs are mature or where there is an existing Mission System needing a Support System to be developed and implemented in Australia.

• Typically the design effort for these types of projects could last for two years or more, but in most cases they would be completed in less than two years.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
ASDEFCON (Complex Materiel) Volume 2

- ASDEFCON (Complex Materiel) Volume 2 can be scaled up using elements of ASDEFCON (Strategic Materiel)
- For example:
  - Mandated System Review (MSR) checklists can be drawn from ASDEFCON Strategic Materiel to increase rigour in design and development review where necessary
  - In the ILS program the Strategic Materiel template content on Support System Detailed Design Reviews could be added to Complex Materiel template

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

ASDEFCON (Complex Materiel) Volume 1

- Suitable for low technical risk procurements that have no significant design and development activity—for example:
  - non-developmental,
  - incorporate standard manufacturer options,
  - need only a minor development activity to meet Commonwealth requirements with low technical risk
- Can be used for high-value and low risk procurements of off-the-shelf materiel.
- Commonwealth governance and assurance mechanisms are minimal, commensurate with a low level of technical risk.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
ASDEFCON (Complex Materiel) Volume 1

• Includes a SOW to allow for the inclusion of eg:
  – requirements for installation;
  – on-site equipment verification (ie, final inspection and test); and
  – some development of support resources, eg Commonwealth-unique training.
• Can be used for a principal contract in a MINCE project, for secondary procurements in a MCE project, or for standalone procurements in the In-Service Phase.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

ASDEFCON Standing Offers

• May be used for procurement of off-the-shelf materiel items and follow-on maintenance services.
• ASDEFCON (Standing Offer for Goods) may be used when off-the-shelf goods will be procured.
• May also be used to procure maintenance services with the incidental purchase of Repairable Items (RI) using list prices or Survey and Quote (S&Q) provisions.
• Once a standing offer is established, an Official Order is used for each purchase.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
Simple Procurement

- The common features of Simple Procurement activities is:
  - straightforward nature;
  - no requirement for specifications or a detailed statement of work to describe repair / maintenance services.
- Can use standing offer and panel arrangements, standard forms, or a ‘shortform’ contract to acquire goods and services.
- Templates include Form AC565, and Form SP020 or the ASDEFCON (Shortform Goods) template.

Example: Materiel Acquisition Template Selection

- Determine if developmental or not:
  - Market survey
  - Existing product knowledge
  - ASDEFCON Request For Information
- If non-developmental Complex Materiel 1 and Simple templates may be suitable with appropriate clauses for demonstrations, installations, final inspection and test (ie, for verification) etc.
- If developmental Strategic Materiel and Complex Materiel 2 templates may be suitable with SOW to reflect technical complexity and associated technical risks.
Step 3: Tailoring of ASDEFCON Templates

- The following steps are required for tailoring:
  - Use Standardised Templates
  - Incorporate Strategic Direction
  - Apply Tailoring Process
  - Changing Scale, Up or Down

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

Step 4 – Non-Materiel Procurements

- ASDEFCON Suite:
  - ASDEFCON (Shortform Services),
  - Eminent Persons Engagement Agreement;
  - ASDEFCON (Services);
  - ASDEFCON (Standing Offer for Services)

- Facilities suite of contracting templates, must be used for construction procurements.

- Non-Materiel ICT Procurements: The SourceIT model contracts, managed by Dep of Finance, are for procurement of relatively low risk and low value HW, SW, and services.

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016
Step 5 – Defence Asset Templates

• ASDEFCON templates have been developed to assist Defence to:
  – dispose of a Defence asset;
  – temporarily transfer possession of a Defence asset to an external agency or entity.

• The ASDEFCON Asset templates include:
  – ASDEFCON (Loan of Defence Asset),
  – ASDEFCON (Hire of Defence Asset)

Source: Contract Template Selection and Tailoring Guide Version 2.1 April 2016

Contents of ASDEFCON Templates
Contents of ASDEFCON Templates


Contents of ASDEFCON Strategic Materiel

Preliminary Pages
Part 1 - Conditions of Tender
Part 1 - Annexes to the Conditions of Tender
Part 2 - Draft Conditions of Contract
Part 2 - Attachments to Draft Conditions of Contract
Part 3 - Draft Statement of Work
Part 3 - Annexes to the Draft Statement of Work
Part 3 - Data Item Descriptions
Part 3 - MSR Checklists
Part 3 - Statement of Work

The purpose of the Statement Of Work (SOW) is to communicate, to the Contractor, Commonwealth requirements and standards for work to be carried out under the Contract and to allocate work responsibilities between the Commonwealth and the Contractor.

It brings together all of the ‘technical’ requirements and practices relevant to the CLC into a contract including:

- Project Management
- Systems Engineering
- Integrated Logistics Support
- Configuration Management
- Verification and Validation
- Health, Safety and Environment

The SOW makes statements such as:

“The Contractor shall perform all activities necessary to manage, design, develop, construct, integrate, test, deliver, install and obtain Certification and Acceptance of the Supplies by the Commonwealth in accordance with the Contract.” and

“The Contractor shall allocate the requirements for the Materiel System defined in the FPS at Annex A to the SOW into a System Specification (SS) for the Mission System and a Support System Specification (SSSPEC) for the Support System.”

Source: ASDEFCON (Strategic Materiel) template Section 2
Part 3 - Data Item Descriptions

• A Data Item Description (DID) is a completed document defining the data deliverables required of a contractor.

• Within a solicitation or contract, each DID is uniquely numbered to identify the data deliverables in terms of specific information such as: purpose, description, preparation instructions including a table of contents and descriptions of each section, and references to the Contract SOW. The content section of each DID describes the requirements of the data item.

Source: ASDEFCON (Strategic Materiel)

Part 3 - Data Item Descriptions

• The Contract Data Requirements List (CDRL) is the standard format for identifying potential data requirements in a solicitation, and deliverable data requirements in a contract. The purpose of the CDRL is to provide a standardised method of clearly and unambiguously delineating the minimum essential data needs.

• Data Items can be important plans to be delivered to Defence. For example a Tender Data Requirement List (TDRL) requires each tenderer to provide a draft Project Management Plan (PMP) in accordance with the Contract DID for the PMP, DID-PM-MGT-PMP.

• Under the CDRL, these plans and documents may not be required to be delivered until some time after Effective Date.
Part 3 - Data Item Descriptions

• The SOW specifies that the Contractor shall produce, update and deliver all data items to the Commonwealth in accordance with the CDRL contained in the SOW.

• In accordance with the CDRL for each data item the Commonwealth Representative will then:
  – Review;
  – Approve or not Approve;
  – Accept or reject; or
  – Consider a Contract Change Proposal (CCP) for Approval.

Source: ASDEFCON (Strategic Materiel)

Part 3 – Master System Review Checklists

• The MSR Checklist sets out the Commonwealth's requirements and minimum expectations for the conduct of various reviews throughout the contract. The checklists include 'exit criteria' for assessing review completion.

• These reviews include:
  – Integrated Baseline Review (IBR)
  – System Requirements Review (SRR)
  – System Definition Review (SDR)
  – Preliminary Design Review (PDR)
  – Detailed Design Review (DDR)
  – Support System Detailed Design Review (SSDDR)
  – Task Analysis Requirements Review (TARR)
  – …

Source: ASDEFCON (Strategic Materiel)
Part 3 – Master System Review Checklists

- …
  - Long Lead Time Items Review
  - Spares Provisioning Preparedness Review (SPPR)
  - Support and Test Equipment Provisioning Preparedness Review
  - Training Equipment Provisioning Preparedness Review (TEPPR)
  - Training Readiness Review (TNGRR)
  - Facilities Readiness Review (FACRR)

Source: ASDEFCON (Strategic Materiel)

Part 3 – Master System Review Checklists

Important reviews concerning the built system:

- **Functional Configuration Audit (FCA):** objective is to demonstrate that the item's actual performance complies with all elements of its specification (applicable to the Mission System and Support System)

- **Physical Configuration Audit (PCA):** objective is to formally examine the as-built version of a Configuration Item against its design documentation in order to establish the Product Baseline.

- **Test Readiness Review (TRR):** relates to a specific V&V phase for a Configuration Item, group of Configuration Items, subsystem, component (including Support System Constituent Capability) or system (including Mission Systems, Support System or combination thereof).

Source: ASDEFCON (Strategic Materiel)
Part 3 – Master System Review Checklists

Important reviews concern the built system:

• **System Acceptance Audit (SAA):** objectives are to demonstrate that Mission Support System elements meet required criteria, is safe and suitable for service to enable Mission System Acceptance to be achieved, and can be effectively operated.

• **Transition Requirements Review (TXRR):** objectives are to demonstrate that the requirements for the transfer of materiel Supplies and processes from the Contractor (Acquisition) to the Contractor (Support) and to Commonwealth support organisations have been identified and clearly defined.

Source: ASDEFCON (Strategic Materiel)

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Governance, Risk Management and Assurance
Governance

• Since 80’s the term governance has become ubiquitous. It is argued that a catalyst was the stock market crash in 1987 and the subsequent collapse of many corporate entities around the world which led to calls for the reform of corporate governance mechanisms.

• The Organization for Economic Co-Operation and Development (OECD) in its Principles of Corporate Governance states: “One key element in improving economic efficiency is corporate governance, which involves a set of relationships between a company’s management, its board, its shareholders and other stakeholders.”

AS 8000—2003 Good governance principles

Governance

• While the focus has been on companies and not public sector entities, the general principles of corporate governance translate across to the public sector with appropriate recognition of the different legal frameworks and types of stakeholders and the purpose of the entity.

• The Australian Standard on Good Governance principles states that:
  “The essence of good governance is accountability”.

Source: AS 8000—2003 Good governance principles
Governance

Public sector governance covers:

‘...the set of responsibilities and practices, policies and procedures, exercised by an agency’s executive, to provide strategic direction, ensure objectives are achieved, manage risks and use resources responsibly and with accountability.’

Good governance is about both:

- **performance**: using governance arrangements to contribute to performance and delivery of goods, services or programs; and
- **conformance**: ensuring that agency meets requirements of the law, regulations, published standards and community expectations of probity, accountability and openness.

Source: Building Better Governance, Commonwealth of Australia 2007

PGPA Act 2013

- An Act about the governance, performance and accountability of, and the use and management of public resources by, the Commonwealth, Commonwealth entities and Commonwealth companies, and for related purposes
- The PGPA Act applies to all Commonwealth entities and Commonwealth companies. Related rules and other legislative instruments establish the requirements and procedures necessary to give effect to the governance, performance and accountability matters covered by the PGPA Act.

Governance: CLC Accountability Model

The CLC Accountability Model is a key element in Defence governance.

Assurance, Compliance, Risk Management

- Also fundamental to successfully implementing better governance are comprehensive:
  - risk management,
  - compliance, and
  - assurance systems.
- Governance and assurance regimes aim to manage risk in business operations while preserving accountability for performance.
Risk Management

Governance and Risk Management

- Effective and efficient use of Commonwealth resources can be aided by sound risk management practices.
- To increase the likelihood of achieving desired outcomes, informed decisions should be made based on evaluation of the associated risks.
- All agencies need to establish and implement sound systems for risk oversight and management and internal control, and these systems should be integrated into the business planning process.

Source: Building Better Governance, Commonwealth of Australia 2007
PGPA with respect to Risk Management

Under the PGPA Act (Section 16) Defence has a duty to establish and maintain systems relating to risk and control:

“The accountable authority of a Commonwealth entity must establish and maintain:

– an appropriate system of risk oversight and management for the entity; and
– an appropriate system of internal control for the entity.”

Source: PGPA Section 16

Duties of Commonwealth Officers

• The PGPA Act seeks to improve the high level accountability of all Commonwealth entities through focusing on their duties, internal controls and the way they engage with, and manage, risk.

• Officers of the Commonwealth must observe their obligations in relation to risk management and risk control.

• Note 2: This duty includes managing consultants and independent contractors who work for the entity, even if they are not officials of the entity.

Source: PGPA Section 16
Definitions

• Risk is defined as the ‘effect of uncertainty on objectives’ and Risk Management as the ‘coordinated activities to direct and control an organisation with regard to risk’.

• Risk control is the means by which organisations take action to reduce or eliminate threats to their operations. It is a technique that uses findings from risk assessments of potential risk factors which can include technical and non-technical aspects of the business.


Risk Management Process

Commonwealth Risk Management Policy

• A Commonwealth Risk Management Policy is in place to set out obligations of Commonwealth entities in relation to risk management and its role in decision-making.

• The goal of the Commonwealth Risk Management Policy is to embed risk management as part of the culture of Commonwealth entities where the shared understanding of risk leads to well informed decision making.

Source: DOF Website Commonwealth Risk Management Policy.

• The Commonwealth Risk Management Policy sets out nine elements which non-corporate Commonwealth entities (entities) must comply with in order to establish an appropriate system of risk oversight and management.

Commonwealth Risk Management

• The nine elements of the Commonwealth Risk Management Policy are:
  – Establishing a risk management policy;
  – Establishing a risk management framework;
  – Defining responsibility for managing risk;
  – Embedding systematic risk management into business processes;
  – Developing a positive risk culture;
  – Communicating and consulting about risk;
  – Understanding and managing shared risk;
  – Maintaining risk management capability; and
  – Reviewing and continuously improving the management of risk.
Defence Risk Management Policy

• Defence Joint Directive (JD) on the management of risk in Defence states:
  – “Risk management is to be integrated into all planning, approval, review and implementation processes, at all levels, to ensure that risk is one of the major considerations in decision-making. Risk assessments are to be conducted in all new activities and functions” (Joint Directive 30/2015 CDF/OUT/2015/682)
• The JD emphasises that a key principle applying to all decisions is to accept and treat individual risks based on evidence.
• Evidence-based risk management across the CLC requires a strong risk framework supported by proven methodologies.

Risk Management and the CLC

• Impact of risk management obligations on the CLC are various:
  – Must understand and assess risks.
  – Must have targeted approach to risk management and control.
  – Must not longer be risk averse in decision-making.
• Decisions made with understanding of risks is core to progressing through CLC.
Risk Management and the CLC

- Multiple risk frameworks related to the CLC in Defence include but are not limited to:
  - Risk Mitigation Phase emphasising risk mitigation activities.
  - Risk focus of IC considerations.
  - Smart Buyer Risk Framework (Risk and Drivers Analysis).
  - Specific Technical Risk Assessment (TRA) and Technical Implementation Risk Assessments (TIRA).
  - Technical certification and acceptance.

Risk Management Frameworks

- Each of the Risk Frameworks may adopt different approaches and risk matrices to reflect their business needs.
- Defence officers must ensure that under these circumstances risks are adequately consulted, assessed, understood and communicated.
- As an example technical certification authorities (e.g. Maritime and Air) may use a different risk matrix structure to the standard risk matrix used in ISO 31000. Under these circumstances the risks must be assessed, recorded and communicated in a consistent manner.
**Risk Management and WHS**

- Part of Risk Management obligations relate to WHS.
- WHS requirements are integrated into the Capability Life Cycle.
- Primary duty holders have been identified for each CLC phase.
- Duty holders are accountable for the guidance, supporting processes and evidence to ensure that Defence's WHS obligations are met.

Source: Interim CLC Manual

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**Risk Management as part of Smart Buyer**

- Risk identification, assessment and treatment actions are central to Smart Buyer to help Capability Managers and Delivery Groups identify key project risks early in the CLC.
- 17 areas of risk are used as the basis for risk identification and assessment – nine during acquisition and eight during sustainment which are likely to be common to many if not all Defence projects and programs.
- Smart Buyer provides high level guidance but relies heavily on the experience and expertise of those applying it.
Risk Management as part of IPMP

• The IPMP is expected to describe the Project Risk Register (PRR) including:
  – where the PRR is located and how it is managed;
  – any tool support or implementation details (e.g. CDMRT2 and PREDICT!); and
  – how often the PRR and the associated risks are to be reviewed and identify the records to be maintained.

Risk Mitigation as part of PES, IPMP

• Projects can seek Capability Development Funding between Gates to conduct risk mitigation activities and solicitation.

• PES and IPMP will include details of proposed risk mitigation studies that will inform cost, schedule and performance considerations. Examples of risk mitigation activities include:
  – Platform surveys and analyses
  – In/Outsourcing support trade study
  – Basis of Provisioning Study
  – Facilities Requirements Study
Impact of Risk-based approach to CLC

- Clear understanding and consideration of risks in decision-making.
- Conscious risk reduction mindset throughout the CLC (not just to Gate 2).
- Targeted risk control actions focused on identified risks.

Implementing Risk Mitigation
The Capability Life Cycle (CLC) and Capability Management Practices

Implementing Risk Mitigation

Practical example of Risk Mitigation
ANZAC Electronic Support System

1. Identify Development and Implementation Risks
   - Installation/Platform Integration complexity
   - Continuity of vendor workforce through the different phases of the Defence approval life cycle
   - Different parts of the system being developed to different timelines
   - Multiple interdependent vendors
   - Overseas design and production of significant part of system with local platform installation
   - Geographically distributed design and production efforts (and timezone differences)
Practical example of Risk Mitigation

Define targeted Risk reduction actions:
- Agreed a FFBNW strategy
- Partitioned the system so it could be delivered in stages
- Equipment and Combat System vendors briefed each other/worked together on their respective systems and ‘self-organised’ through design, development and T&E
- Continuous engagement with vendors for risk reduction efforts
- Defence as the Prime System Integrator

Key Points for Risk Management

- Conscious Risk Reduction mindset throughout the project.
- Kept the teams working – limited learning curve problems and costs.
- Established and maintained good relationships between stakeholders.
- Shared culture across Defence and vendors of cooperation, well-understood goals and a desire for success – it is possible.
- Above approach can be adopted for any acquisition.
The Capability Life Cycle (CLC) and Capability Management Practices

Assurance

Assurance as it relates to the CLC

- Definitions
- Role of Assurance
- Key Principles
- Breadth and Depth of Application for the CLC
- Tailoring application of assurance where appropriate
Definitions of Assurance

1. **Assurance**: A positive declaration intended to give confidence; a promise. (Source dictionary reference)

2. **Assurance**: Part of corporate governance in which a management provides accurate and current information to the stakeholders about the efficiency and effectiveness of its policies and operations, and the status of its compliance with the statutory obligations. Source: [http://www.businessdictionary.com/definition/assurance.html](http://www.businessdictionary.com/definition/assurance.html)

3. **Assurance**: grounds for justified confidence that a claim has been or will be achieved. ISO/IEC 15026-1:2013(en)

4. **Compliance Assurance**: Measures instituted by a government agency to ensure that the provisions of its regulations are being met. Source: [http://www.businessdictionary.com/definition/compliance-assurance.html](http://www.businessdictionary.com/definition/compliance-assurance.html)

5. **Technical Assurance**: Process by which the technical integrity of a product, process, or system is monitored and maintained. Source: [http://www.businessdictionary.com/definition/technical-assurance.html](http://www.businessdictionary.com/definition/technical-assurance.html)

Assurance in Capability Management

- A structured and deliberate approach to risk management processes supports PGPA duties through:
  - reducing and controlling risk; and
  - enabling informed decision-making
- An important element of risk-based decision-making across the CLC, is confidence that:
  - arguments presented are sound and based on evidence;
  - claimed status of capability management is accurate; and
  - outcomes satisfy organisational objectives.
- Assurance activities are conducted across the entire CLC and across various dimensions of capability management (e.g., technical, safety, financial, seaworthiness) to provide confidence to decision-makers and managers.
- Provides the basis for action.
Description of Assurance Cases

• “Reasoned, auditable artefact created that supports the contention that its top-level claim (or set of claims), is satisfied, including systematic argumentation and its underlying evidence and explicit assumptions that support the claim(s)”

AS4360 (Risk Management)

• Assurance Cases contain the following:
  – one or more claims about properties;
  – arguments that logically link the evidence and any assumptions to the claim(s);
  – a body of evidence and possibly assumptions supporting the arguments for the claim(s);
  – justification of the choice of top-level claim and the method of reasoning.

Source ISO/IEC 15026-1:2013(en)

Establishing a Assurance Program

• Program, Product and Project Sponsors should understand the range of assurance activities that they will be engaged in from initiation of Proposal through to realisation and in-service operation of a capability.

• Understanding of the assurance activities enables appropriate planning and collection of evidence to support assurance cases.

• The assurance activities can be captured in the IPMP and appropriate subordinate plans.

• Where possible assurance activities should be tailored to the particular circumstances and needs.
The Capability Life Cycle (CLC) and Capability Management Practices

Types of Assurance across the CLC

- Contestability
- Gate Reviews / IAR
- Deep Dive Reviews
- SCRAM
- Major System Reviews
- Audit
- Reporting
- V&V
- T&E
- Certification
- I2 Assurance
- Quality Assurance: Supplier and Product Assurance
- Engineering Assurance

Contestability Framework

- Key assurance activity during Investment Approval Pathway
- Reviews force design outputs and all Gate submissions to ensure:
  - alignment with strategic resource and capability guidance; and
  - an acceptable basis for decision making.
- Checks that plans to proceed to next gate can be executed.
- Reviews risk assessments and treatment strategies.
- Reviews cost and schedule estimates.
- Participates in independent assurance reviews and ‘deep dives’.
The Capability Life Cycle (CLC) and Capability Management Practices

Review Panels

The reporting framework is augmented by two additional independent assurance mechanisms which review the health of a Program, Product or project:

- **Gate Reviews:** The Capability Manager or Program Sponsor and/or the Delivery Group initiate an independently chaired review panel before all gates and critical milestones.

- **In Depth Reviews:** The Program Sponsor, VCDF or DepSec Strategic Policy and Intelligence or Delivery Group Head, may also initiate an independently chaired In Depth Review as a result of a significant trigger or particular concern.

Program-level Health Checks

- **Program-level health checks** are the responsibility of the Program Sponsor and are conducted on a regular basis.

- Health checks support progress reporting to the Capability Manager, members of the Program Steering Group and other key stakeholders, typically on a tri-annual basis.

- This reporting methodology is standardised across the Integrated Investment Program to minimise or eliminate the need for additional performance reporting.
Deep Dive reviews

- **Deep Dive** is a Force Design Division led review activity:
  - supported by the Program Sponsor and Contestability Division (as appropriate)
  - scheduled in the Force Design Forward Work Plan
  - focuses on a Program, cross-Program or Capability Stream
  - revisits assumptions and analyse the status of existing, planned and future capabilities and transitional aspects within the scope of the activity.

Independent Assurance Reviews (IARs)

- **IARs** are the Group Level component of CASG’s assurance framework (Program/project Quality Reviews).
- They provide reliable advice regarding the continuing viability of capability investment decisions as well as the health and outlook of programs, acquisition projects and sustainment products.
- The IAR uses a specifically chartered Board with distinct skills and experience to examine the current state of a program, project or product.

Source: CASG Business Framework 2017
Independent Assurance Reviews (IARs)

- The IAR Chair makes recommendations to the relevant CASG Senior Executive and Capability Manager regarding the health and outlook of the activities reviewed and identifies actions to improve performance.
- Reviews occur in the lead up to key project milestones or annually.
- Sustainment reviews occur in the lead up to major events in the product life cycle, such as mid-life upgrades or periodically, one to three years.

Source: CASG Business Framework 2017

SCRAM

- Structured approach to identifying projects risks and issues which have origins in technical or engineering factors eg requirements definition, system design, development, production, and system integration and test including specific aspects software development.
- Understand the impact on project outcomes with focus on schedule.
- Providing evidence and recommendations for treatment of risks and remediation of issues.
When can SCRAM be applied?

- Projections of schedule outcomes at any point in the CLC which need to factor in system and software development and system integration activities.
- To provide evidence for Smart Buyer risk-profiling especially for technical implementation risk up to Gate 2.
- Assessment of project health from Gate 0 through to Acceptance.
- As ‘due diligence’ assessments during management handovers.
- Identification of sources of technical implementation risk.
- Determination of practical risk mitigation actions.

Technical Regulation

- Technical Regulation Technical regulation provides confidence to Capability Managers about the safety and technical integrity of their systems and equipment. This includes fitness for service, safety and environmental compliance.
- The following references govern technical regulation within Defence and apply in conjunction with applicable laws and regulations.
Technical Regulation

- Seaworthiness:
  - Defence Seaworthiness Management System Manual (DSwMS) (Jun 17)
  - N4 Library
- Airworthiness:
  - Defence Aviation Safety Regulation (DASR) introduced in 2016 and replaced the Military Operational and Technical Airworthiness Regulations
- Land Technical Regulation
- Explosive Ordnance Regulation
  - DI (G) LOG 4-1-006 - Safety of Explosive Ordnance

Audit

- Auditing is a cornerstone of good public sector governance.
- Objective assessments of whether public resources are managed responsibly and effectively to achieve intended results, auditors help public sector organizations achieve accountability and integrity, improve operations, and instill confidence among citizens and stakeholders.
Range of Audits

In quality management there are three main categories of audits, which depend on the relationship between the auditor and the person being audited: first-party, second-party, and third-party audits.

- **Third-Party Audits**: A third-party audit occurs when an organisation engages an independent party to perform an audit. This can be used when the organisation wishes to create a quality management system (QMS) that conforms to a standard set of requirements, such as ISO 9001, and to verify that outcome.

- …

- **Second-party audit**: when an organisation performs an audit of a supplier to ensure that they are meeting the requirements specified in the contract or other agreement. All or part of the contract or agreement can be audited. It is important to understand that a second-party audit is between the customer and the supplier and has nothing to do with becoming certified.

- **First-Party Audits**: are often called *internal audits*. This is when someone from the organisation itself audits a process or set of processes in the quality management system to ensure it meets that required. The audit is on behalf of the organization and not a customer or certification body.

https://advisera.com
The Capability Life Cycle (CLC) and Capability Management Practices

ANAO

- Relevant activities of ANAO:
  - Performance audits of Australian Government programs and entities;
  - Assurance reviews of Australian Government entities.

- ANAO Auditors use tools such as financial audits, performance audits, investigations, and advisory services to fulfill each of these roles.

Audit

- Auditing is a cornerstone of good public sector governance.
- Objective assessments of whether public resources are managed responsibly and effectively to achieve intended results, auditors help public sector organizations achieve accountability and integrity, improve operations, and instill confidence among citizens and stakeholders.

The Role of Auditing in Public Sector Governance 2nd edition Jan 2012
Implementing Risk Mitigation

Master System Reviews/ System Reviews

- The Master System Reviews are based on System Engineering reviews which provide assurance on achievement of progress for contracted work. This is inherently represents a form of Assurance Case for each logical step in system development, production and delivery.

- Pivotal Master System Reviews which are undertaken for most materiel acquisitions include:
  - Integrated Baseline Review (IBR)
  - System Requirements Review (SRR)
  - System Definition Review (SDR)
  - Preliminary Design Review (PDR)
  - Detailed Design Review (DDR)
  - Support System Detailed Design Review (SSDDR)

Source: ASDEFCON (Strategic Materiel)
The Capability Life Cycle (CLC) and Capability Management Practices

Technical Reviews/ Audits

Important reviews concerning the built system:

- **Functional Configuration Audit (FCA):** objective is to demonstrate that the item's actual performance complies with all elements of its specification (applicable to the Mission System and Support System).

- **Physical Configuration Audit (PCA):** objective is to formally examine the as-built version of a Configuration Item against its design documentation in order to establish the Product Baseline.

- **Test Readiness Review (TRR):** relates to a specific AV&V phase for a Configuration Item, group of Configuration Items, subsystem, component (including Support System Constituent Capability) or system (including Mission Systems, Support System or combination thereof).

Source: ASDEFCON (Strategic Materiel)

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Part 3 – Master System Review Checklists

Important reviews concern the built system:

- **System Acceptance Audit (SAA):** objectives are to demonstrate that Mission Support System elements meet required criteria, is safe and suitable for service to enable Mission System Acceptance to be achieved, and can be effectively operated.

- **Transition Requirements Review (TXRR):** objectives are to demonstrate that the requirements for the transfer of materiel Supplies and processes from the Contractor (Acquisition) to the Contractor (Support) and to Commonwealth support organisations have been identified and clearly defined.

Source: ASDEFCON (Strategic Materiel)
Test and Evaluation

Reasons for T&E

- T&E can be conducted for a number of reasons which can all be viewed as assurance ie grounds for justified confidence that a claim has been or will be achieved:
  - Prove a concept
  - Ensure compliance
  - Ensure safety
  - Confirm success of modifications
  - Support acquisition decisions (compare systems, confirm performance)
  - Verify supportability
  - Provide feedback during design (as well as during manufacture, etc)
Defence T&E Policy

- Key project milestones for acquisition phase must have objective outcomes proved through the results of T&E to contain risk within acceptable boundaries, and ensure the system meets requirements.
- Funding for conducting T&E required for the capability life cycle—through the TEMP, as part of CDD.
- Detailed planning to collect data to resolve COIs is outlined in the TEMP which is updated as the project matures through the acquisition and in-service phases.
- Personnel employed in planning, managing or conducting T&E must be trained.

System T&E

- Ensures consistent and coordinated approach to system testing.
- Directs the focus of T&E effort at different life-cycle stages.
- Aims to progressively test and evaluate the system as it passes through the life cycle.
- Aims to identify problems early to avoid costly and time consuming rectifications later.
- T&E is a major technical risk mitigation measure.
The Capability Life Cycle (CLC) and Capability Management Practices

<table>
<thead>
<tr>
<th>System T&amp;E</th>
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<tbody>
<tr>
<td>• Testing can be expensive and time-consuming:</td>
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<tr>
<td>– Specialised test equipment</td>
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<tr>
<td>– Highly trained personnel</td>
</tr>
<tr>
<td>– Expensive operating costs</td>
</tr>
<tr>
<td>– Facilities</td>
</tr>
<tr>
<td>• The TEMP is the formal plan that is used to manage the entire T&amp;E effort.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>T&amp;E Categories</th>
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</thead>
<tbody>
<tr>
<td>• Developmental Test and Evaluation (DT&amp;E)</td>
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<tr>
<td>– Largely undertaken in the Acquisition Phase</td>
</tr>
<tr>
<td>– Support design and development effort</td>
</tr>
<tr>
<td>– Generally undertaken by contractors</td>
</tr>
<tr>
<td>• Acceptance Test and Evaluation (AT&amp;E)</td>
</tr>
<tr>
<td>– Formal acceptance testing on behalf of customer</td>
</tr>
<tr>
<td>– Between the Acquisition and Utilisation Phases</td>
</tr>
<tr>
<td>• Operational Test and Evaluation (OT&amp;E)</td>
</tr>
<tr>
<td>– Focuses on functional or operational testing of the system</td>
</tr>
<tr>
<td>– Generally undertaken by users following acceptance</td>
</tr>
<tr>
<td>– Some OT&amp;E can occur earlier during Acquisition Phase, particularly for large, phased projects</td>
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</tbody>
</table>
Verification and Validation

Verification and Validation (V&V)

- The entire systems engineering process aims to produce a system that is:
  - verified against the documentation produced (MOPs), and
  - validated against the original needs, goals and objectives (MOEs).
- V&V ensures that we have both:
  - built the system right (verification);
  - and built the right system (validation)
- The T&E effort supports V&V.
V&V

- Verification involves testing of the system (or a subsystem) against the technical performance specifications [MOPs from the FPS].
- Validation involves testing of the (entire) system against the user/customer’s operational effectiveness and suitability requirements [MOEs from the OCD].

Methods of V&V

- T&E
- Demonstration
- Experiment
- Analysis
- Modelling
- Simulation
- Inspection/examination
- Similarity
- Certification
- Implication

The Capability Life Cycle (CLC) and Capability Management Practices

T&E in V&V


V&V
The Capability Life Cycle (CLC) and Capability Management Practices

Dr Mike Ryan
Dr Shari Soutberg

Day 5
Introduction to the Capability Life Cycle (CLC)
CLC Artefacts
Meaning of Artefact

• An artefact may be defined as an object that has been intentionally made or produced for a certain purpose.
  
  Source: Stanford Encyclopedia of Philosophy

• In software development, artefact can refer to tangible products associated with the software development including requirements, models, design documents, as well as project plans, business cases, and risk assessments. Artefacts help describe the development as well as the function, architecture, and design of the software.

• We will use artefact as any means of communicating information associated with the CLC including documents, models, plans, architectures, and proposals.

Scope of Artefacts being covered today

• Many artefacts are created through the CLC from early FSR Narratives through to project closure and materiel disposal documentation.

• This course will focus on those CLC artefacts:
  – which have been identified as core to the CLC
  – which are to be developed by Capability Managers and Delivery Groups

• Key CLC artefacts can be divided into two broad categories:
  – Program: for proposals or as common references for subordinate projects/products
  – Project/Product: for proposals
Key CLC Artefacts

- **Program-reference:**
  - Capability Program Narrative (CPN)
  - Program Strategy
  - Program Integrating Operational Concept (PIOC)
- ...
Key CLC Artefacts

- Proposal Artefacts at Program, Project or Product level:
  - Joint Capability Narrative (JCN)
  - Joint Capability Needs Statement (JCNS)
  - Project Execution Strategy (PES)
  - Business Case which supports Proposals & Submissions
  - Integrated Project Management Plan (IPMP)
  - Capability Definition Documents (CDD)
    - Operational Concept Document (OCD)
    - Function and Performance Specification (FPS)
    - Test and Evaluation Master Plan (TEMP)

Program-reference Artefacts

<table>
<thead>
<tr>
<th>What and Why</th>
<th>How</th>
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<tbody>
<tr>
<td>Defence White Paper</td>
<td>PGPA Act</td>
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<tr>
<td>Strategic Guidance</td>
<td>DPPM</td>
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<tr>
<td>Force Design</td>
<td>CPRs</td>
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<td>FOE</td>
<td>DIP</td>
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<td>JCF</td>
<td>Smartbuyer</td>
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<td>AJOC</td>
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<td>FIOC</td>
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<td>Concepts</td>
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<td>Issued by JCA in PMOM</td>
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CPN

Program Strategy

JCN

Proposal = Sponsor’s Paper + JCNS + PES

OCD

FPS 1

FPS 2

Project WBS

Tender and Contracting Documents

Issued by JCA to the CM

Raised within Force Design as Program level direction
Program

A program is a group of related projects managed in a coordinated manner to obtain benefits not available from managing them individually. Program management is the application of knowledge, skills, tools and techniques to meet program requirements.

Source: PMI website

A Program, in the context of managing Defence capability, is defined as a group of related Projects, Products, and activities that are managed in a coordinated way to optimise capability outcomes within allocated resources.


Programs

- Features of Programs:
  - Group of related interdependent Projects, Products and activities that are expected to contribute to an overarching objective.
  - Constituent Products, Projects, and activities which are largely managed separately and will likely be at different phases of the capability life cycle.
  - The Program Authority (Sponsor or Manager) is accountable for the combined outcomes.
The Capability Life Cycle (CLC) and Capability Management Practices

Benefits of Programs for CLC

There are four areas of benefit for introducing a Program layer as part of the CLC:

• realisation of Joint Force outcomes
  – managing across projects which deliver integrated and interoperable capability systems
• improved acquisition and sustainment of similar or common capability systems
• more aligned and efficient management of related capability systems in a resource constrained environment
• aids prioritisation of the Integrated Investment Program
  – groups investment proposals which can better show how government directed outcomes will be/ have been delivered

Program Management Functions in CLC

• Decision Making Forum: through Program Steering Groups
• Health Checks: Program-level health checks
• Review Panels: Gate Reviews and In Depth Reviews
• Program Risk Management
• CM coordinates capabilities that span multiple Programs
• Program Sponsor uses PS and PIOC to coordinate cross-Program linkages.
The Capability Life Cycle (CLC) and Capability Management Practices

**Systems of Systems**

- System of Systems (SoS) is “an integration of a finite number of constituent systems which are independent and operable, and which are networked together for a period of time to achieve a certain higher goal (Jamshidi 2009).”

- Five key characteristics of SoS.
  - Operational independence of constituent systems
  - Managerial independence of constituent systems
  - Geographical distribution
  - Evolutionary development processes
  - Emergent behaviour
  (“Architecting Systems of Systems” by Maier (1998))

**SoS in Defence context**

- Defence systems are generally operationally independent but must be capable of integration and interoperability and performing in different roles
- There are different ‘owners’ of capability systems based on multiple Capability Managers through to multiple Project and Product Managers
- Operation and management of capability systems is organisationally and geographically distributed
- SoS capability evolves through capability systems which are developed, introduced and retired asynchronously
- Defence capability delivered through a group of systems is generally enduring over time even though the constituent systems will change over time
Programs & SoSs: two related concepts

- Common feature: group of elements which delivers benefits greater than the sum of individual elements.
- Program: focus on management aspects.
- Systems of Systems (SoS): focus on delivering capability through engineering outcomes through SE and SoS Engineering (SoSE).
- Program Management can be supported by System of Systems (SoS) thinking and engineering approaches.
- Program Management and SoSE are complementary practices for delivery of Defence Joint Force outcomes.

SoS and Programs

SoS approach and SoSE can be used in the CLC to:

- optimise the outcomes delivered through the new systems (Projects) and legacy (Products) which together satisfy the Program objectives.
- provide techniques that enable decision-makers to make informed decisions on architectural solutions for SoS problems across eg technical performance, costs.
- provide a deliberately managed approach to the definition, design and delivery of capability systems in a Program across Projects and Products.
Program Mgt & SoSE for Joint Capability

Requires deliberate management of four aspects of relationships between capability systems that are either in Proposal, Project, or Product ‘stage’:

- Program Management:
  - Management across all FIC: schedule etc
- SoS Requirements and Design:
  - Operational (based on CONOPS)
  - Function and Performance
  - Technical: system requirements, system interface requirements (including eg standards and their versions and tailoring)

Program layer as ‘umbrella’ reference

Efficient: Each subordinate artefact leverages the parent artefact so that only the essential ‘delta’ is developed

Aligned: Related Projects and Products reference common program information to enable joint force outcomes
Program artefacts as a common reference

- Program-level artefacts provide an overarching reference for constituent projects and products.
- Common reference information spanning business and technical requirements, design and management implementation aspects applicable to all constituent elements.
- Efficient: Each subordinate artefact leverages the parent artefact so that only the essential ‘delta’ is developed.
- Aligned: Related Projects and Products reference common program information to enable aligned and, where appropriate, joint force outcomes.

Role of the Program Sponsor

- Oversight, monitoring, and decision-making including the authority to reconcile issues between constituent Projects, Product and activities.
- Define shared objectives across Projects/Products and identifies and manage risks relevant to Program objectives.
- Establish and authorise common reference information spanning business and technical requirements, design and management implementation aspects applicable to all constituent systems.
- Provides appropriate governance arrangements including clear decision-making and escalation structures
- Reporting performance of Programs for Capability Stream Leads to prioritise.
### Program CLC Artefacts

<table>
<thead>
<tr>
<th>Artefact</th>
<th>Description</th>
<th>Developed by</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPN and JCN:</td>
<td>Narratives which inform required capability of the subject group of capability systems</td>
<td>Force Design Division</td>
<td>Force Design Division</td>
</tr>
<tr>
<td>PIOC:</td>
<td>Operational and other features of the capability grouping both within the Program and relationships with other Programs</td>
<td>Program Sponsor</td>
<td>Program Sponsor Endorsed by Joint Capability Authority</td>
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<tr>
<td>Program Strategy:</td>
<td>Activities, management arrangements, including integrated schedule across related Projects and Products within the Program</td>
<td>Program Sponsor</td>
<td>Program Sponsor</td>
</tr>
<tr>
<td>Program Architectures:</td>
<td>Program features using Defence Architecture Framework (DAF) conventions</td>
<td>Proposed</td>
<td>Proposed</td>
</tr>
</tbody>
</table>

### SoS architecture practice for Programs

- “An architecture is the structure of components, their relationships, and the principles and guidelines governing their design evolution over time” (IEEE 610.12-1990).
- Can use architectures for CLC SoS and Programs to provides a common and enduring reference for decisions for Proposals, Projects and Products.
- SoS (and Program) architectures describes:
  - how constituent systems are used (CONOPS)
  - operational, functional and technical relationships and dependencies between constituent systems
  - end-to-end functionality and flows of information and data (and other resources).

Source: Based on SEBoK Architecting approaches for SoS
Contestability at Program-level

- Contestability is performed at Program level to assure government and senior stakeholders that Programs are aligned with strategic guidance and resource allocation.
- Contestability is conducted as part of the review of the CPN and JCN.
- The level of contestability should be proportionate to the risk presented by a Program with additional depth of review being possible.

PROGRAM-REFERENCE ARTEFACTS
Capability Program Narrative (CPN)

- Raised by Force Design Division as enduring Program-level direction including concepts and requirements
- Articulates ‘What’ and ‘Why’
- Provides the CM with a synopsis of:
  - operational environment
  - constraints
  - Governance
  - Joint Force needs
  - sustainment arrangements and priorities where relevant.
Capability Program Narrative (CPN)

- The CPN distils strategic and conceptual guidance into actionable deliverable terms.
- CPN distils strategic and conceptual guidance into actionable deliverable terms.
- Contestability reviews strategic fit of the CPN.

Program Strategy
Program Strategy (PS)

• Who develops it?
  – the Program Sponsor on behalf of the CM based on the CPN.
• When is it developed?
  – when a Program is established and then maintained.
• What is its intent?
  – to maintain a pipeline of proposals, Programs and activities.
  – to ensure that known Program gaps and opportunities are managed and prioritised to meet Program capability outcomes and preparedness objectives.

Program Strategy (PS)

• Why is it produced?
  – to describe how the Program outcomes as articulated in the CPN will be achieved.
  – to be the primary document that defines the intent for leading, managing and developing capabilities to satisfy Program outcomes.
  – the PS and PIOC help the CM (through the Program Sponsor) coordinate the activities of the CM, Delivery and Enabling Groups for Proposals, Projects and Products that make up the Program.
Program Strategy (PS)

What is in the PS?

- how the Program is aligned to CPN, Capability Stream requirements and Defence strategic direction
- an integrated planning view of the Projects and Products within the Program, including FIC
- how the Program will develop, deliver, transition and sustain agreed capabilities
- Coordination of sustainment for all Products to maximise the aggregate of capability output across the Program
- Program-level industry opportunities and constraints
- Risks, issues, gaps including risk mitigation and acceptance for both acquisition and sustainment

PS Reviews

Reviews of PS:
- Program Sponsor is responsible for conducting periodic reviews of the Program Strategy to identify and mitigate risk within the Program
- IC may direct that Contestability conducts a review.
The Capability Life Cycle (CLC) and Capability Management Practices

PS content

• Applicable Government direction and strategic guidance (DWP, IIP) and associated narratives eg JCN, CPN
• Defined outcomes and outputs (including priorities) to be delivered by the Program including:
  – military preparedness
  – capability outputs
  – enterprise service outcomes
• Resource, funding and FIC allocation requirements and priorities
• …

Source: Defence Program Strategy Guide

PS content

• …
• Identification of all constituent Proposals, Projects, Products and activities and their relationships/dependencies across operational, technical and programmatic aspects including :
  – Schedule and delivery milestones
  – Activities (eg interface definition)
  – Resourcing including budget and workforce
  – FIC elements
• Linkages and critical dependencies with other Programs (including enablers) across all FIC elements
• …

Source: Defence Program Strategy Guide
The Capability Life Cycle (CLC) and Capability Management Practices

PS content

• …
• Program-level assurance program including T&E concept
• Activities to transition into service and sustainment
• Key risks and risk management actions including escalation approach
• Development gaps and opportunities to feed into Force Design
• Information management incl capture of Program features eg architectural information
• Requirements (incl standards) for Integration and Interoperability
• …

Source: Defence Program Strategy Guide

Program Strategy content (4)

• …
• 12 Month (rolling) Plan in detail including:
  • Key dates for:
    – Program Steering Group,
    – Project Gate Reviews Health Checks
  • Key milestones
• …

Source: Defence Program Strategy Guide
PS content

- …
- Governance
  - Governance and Management forums
  - Key Performance Metrics:
    - Leading indicators that measure program performance
    - Measurement of benefit achievement
    - Aligned with Portfolio-level metrics to support aggregation and reporting to Government
- …

Source: Defence Program Strategy Guide

PS content

- …
- Stakeholders:
  - Internal stakeholders
  - External stakeholders
  - Accountability succession plans
  - Training and skilling requirement
- Budget and Resourcing
  - Bids and funding priorities
  - Capital budget
  - Operating budget
  - Program resourcing (AFS/FTE)
  - Current and projected

Source: Defence Program Strategy Guide
The Capability Life Cycle (CLC) and Capability Management Practices

Program Assurance Strategy

Program Integrating Operational Concept (PIOC)
**PIOC**

- **Who develops it?**
  - developed at the discretion of the Program Sponsor
  - requires endorsement from the JFA
- **When is it developed?**
  - when a Program is established and then maintained
- **What is its intent?**
  - primary co-ordination document to manage intra and inter-Program linkages
  - to provide uniform design guidance to constituent and related Programs, Projects, and Products
  - reduce the level of detail required in documentation

- **Why is it produced?**
  - foundation for the design of proposals, reducing the level of detail required in documentation and to ensure consistency across related document
  - provides impacted Projects and Programs with consistent overarching design direction

- **Who can provide Guidance for developing a PIOC?**
  - Joint Capability Management Integration Division in the Vice Chief of the Defence Force Group.
PIOC

What is in the PIOC?

• Provides design guidance in the form of:
  – the Program’s needs derived from relevant operational scenarios
  – Program-level operational architectures, as derived from joint war fighting architectures developed by the C4ISR Design Authority
  – relevant non-materiel standards to be adopted across the Program
  – detail on capability integrating concepts, needs and objectives

Pilot Model-based PIOC

• Model-based PIOC is being piloted.
• The aim of the model is to provide a single repository:
  – to capture a program’s operational concept
  – program management artefacts,
  – allow each stakeholder to interrogate the model to extract the information relevant to their role.
• Significant alignment with architecture approach to defining program and system features: Defence Architecture Framework (DAF) applies.
Pilot Model-based PIOC

- Expectations from model-based PIOC:
  - common reference for related projects;
  - define project dependencies and associated risks
  - identify integration and interoperability (I2) risks and mitigation actions;
  - support integrated program-level capability design;
  - support visualisation of program dependencies;
  - reduce documentation;
  - reduce project management effort;
  - improve FIC decision making; and
  - support procurement efficiencies.

Pilot model-based PIOC

- The model is also expected to improve:
  - requirements specification and allocation to subsystems;
  - early identification of requirements and traceability
  - system design integrity including definition of boundaries
  - documentation burden
  - operational description of program: mission, relevant policies and doctrine, scenarios, needs and constraints
  - integrating objectives including the Critical Operational Issues (COIs), Measures of Effectiveness (MOEs) and Measures of Performance (MOPs)
  - architectures and standards
  - a functional description of each of the capability system components: FIC overview; Schedule; Dependencies; Risks.
Integration and Interoperability

• Key CLC requirement is realisation of the Joint Force
• The PIOC structure contains information on all related projects and products and the relationship to the program which are relevant to delivering the Joint Force
• Relationships including interdependencies which reflect Integration and Interoperability can be defined using dependency analyses such as SCMILE (Sensing, Command and control, physical Mobility, Information mobility, Logistics (and supply, sustainment and support), Engagement/effect) services analysis. This information could be used to conduct sensitivity to change analysis.

PROPOSAL-LEVEL ARTEFACTS
The Capability Life Cycle (CLC) and Capability Management Practices

Proposal Artefacts

What and Why
- Defence White Paper
- Strategic Guidance
- Force Design Concepts

How
- PGPA Act
- CPRs
- DIP
- Smartbuyer
- DPPM

Portfolio
- FOE
- JCF
- AJOC
- EJOC

Program
- CPN
- PIOC
- Program Strategy

Product
- JCNS
- OCD
- FPS 1
- FPS 2

Issued by JCA to the CM

Proposal = Sponsor’s Paper/JCN/PGPA Act

Joint Capability Narrative (JCN)
JCN

• Who develops it?
  – Force Design Division (Force Options and Plans Branch)

• When is it developed?
  – when a capability need or enabling gap or opportunity identified

• Why is it produced?
  – used to task appropriate CM to develop a more detailed JCNS
  – prepared for the Investment Committee as the rationale for an investment proposal

JCN

• What is in a JCN?
  – provides a conceptual framework for a defined gap or opportunity and ensures joint needs are clearly aligned with strategic guidance
  – articulates gaps, risks, issues or opportunities and the CM’s plan to meet the problem posed
  – articulates time, resource constraints and strategic considerations
  – presents decision makers with broad options
JCN to JCNS Pathway

Pathways:
- JCN is presented to Joint Warfare Council (JWC) if risk, cost or complexity is of concern
- generally directs the CM to nominate a Program Sponsor to develop a JCNS

JCN
- In the absence of JCN, use FSR Narratives and IIP funding profiles as reference
- Contestability reviews the JCN as one of the Force Design outputs
- JCNs are still being developed
Joint Capability Needs Statement

(JCNS)

- Who develops it?
  - Program Sponsor as tasked by CM through a tasking statement
- When is it developed?
  - when a capability need or enabling gap or opportunity identified through a JCN and the CM assigns a Program Sponsor
  - a key output of the Strategy and Concepts Phase
- Why is it produced?
  - an agreed statement of military or enabler need, which determines the capability required to deliver on strategic guidance

Source: Update Interim CLC Manual
**JCNS**

- **What is in it?**
  - high level statement of an identified and bounded capability need and available option sets linked to strategic guidance (usually JCN)
  - represents a defined and bounded system solution to the capability gap
  - system need described as a hierarchical structure of objectives including FIC to address the gaps and opportunities posed in the JCN
  - describes CM’s plan to meet the problem posed by the JCN
  - contribution to joint capability with FIC integration issues highlighted and interdependencies defined

Source: Update Interim CLC Manual

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**JCNS**

- **Who reviews and/or approves the JCNS?**
  - Contestability reviews the Gate 0 submission including the JCNS to test if consistent with strategic guidance
  - presented at Gate 0 for approval by IC (at the same time as the Business Case)
  - Defence Committee (DC) reviews JCNS only for most complex, politically sensitive, novel and/or high risk proposals, especially where they diverge from established policy and endorses further development of selected options.

Source: Update Interim CLC Manual
Contestability and the JCNS

• Contestability Division can assist in the development of the JCNS prior to Gate 0
• Contestability reviews the JCNS prior to Smart Buyer workshops
• JCNS is assessed by Contestability Division for Gate 0 to check if it:
  – aligns with Strategic Guidance
  – aligns with resourcing provisions
  – can be delivered within resourcing direction

Strategic Guidance and the JCNS

• JCNS must clearly reflect but not repeat:
  – JCN
  – CPN
• In the absence of the JCN and CPN, the JCNS must clearly link to (but not repeat) most recent strategic guidance:
  – FSR Narratives
  – Defence White Paper 16
  – Force Structure Review
  – Defence Planning Guidance (DPG)
  – Australian Military Strategy (AMS)
  – relevant Strategic Policy and Joint Concepts
  – IIP funding profiles
Key features required of the JCNS

- Strategic Alignment and Program Coherence
- Justification: evidence supported by logic, traceability
- Prioritisation of Needs in plain English
- Consideration of Joint Force, Integration and Interoperability
- Consideration of all FIC
- Scheduling issues
- Systems Approach:
  - structured derivation of requirements
  - recognition of Systems of Systems
  - clear bounding of the system need to reflect capability gap or opportunity

Project Execution Strategy

(PES)
PES Overview

• High level, risk based tailored strategy to support the Investment Committee decision making of a proposal.

• The PES consists of four strategies, developed using the Smart Buyer Decision Making Framework, in order to articulate the intended project approval pathway and project management, acquisition and sustainment activities.

PES– Key Points

• Who develops it?
  – CM and Delivery Group

• When is it developed?
  – Prior to Gate 0 and evolves after that
  – remains relevant until project closure but may be updated as Project progresses

• Why is it produced?
  – Investment Committee for decision making for the project at Gates 0, 1 and 2 of the CLC;
  – FIC Providers as a common reference for defining their activities
PES—Key Points

- What is its purpose?
  - recommended implementation strategy for realising the capability need - sets broad direction for the entire project
  - High-level, tailored statement of strategy alternatives and recommended approach for the project
  - Shapes development of subordinate project plans including Integrated Project Management Plan (IPMP)

- Features in its development:
  - developed and tailored as per Smart Buyer principles and informed by context, risks and drivers
  - developed in accordance with an asset management approach

PES—Key Points

- What is in it?
  - Project considerations and analysis eg risks, drivers
  - Acquisition and Sustainment Strategies
  - Approvals Strategy and Pathway
  - Project Management approach and project activities

- Review and Approval
  - Gate 0 approval constitutes formal endorsement of the PES and the elements contained within it.
  - reviewed and revalidated at each subsequent CLC approval
PES Relationship with Business Case

• Used as a component of the Business Case, summarised in the commercial, financial and management cases. Note that JCNS represents the strategic case.

• It is the primary output from the Smart Buyer Decision Making Framework containing a summary of the:
  (1) Risk analysis;
  (2) Tailored Approval Pathway;
  (3) Integrated Project Management Plan;
  (4) Acquisition and sustainment strategies; and
  (5) Other Delivery Group specific plans and analysis.

PES development

• **Purpose:** To present the recommended implementation strategy for realising the capability need

• **Developed using three Smart Buyer workshops:**
  – Kickoff
  – Environmental Scan
  – Strategy

• **Produced by:** the Program/Project Sponsor and Integrated Project Manager (IPM) as members of the Integrated Project Management Team (IPMT/IPT)
PES development

- **Presented at Gates:** Evolving PES presented in conjunction with Business Case/Proposal/Submission and the JCNS.
- **Includes** certain areas of discussion:
  - Key Project Factors, Risks and Drivers
  - Preferred Acquisition, Sustainment & Approval Strategies
  - Proposed Information Gathering Activities (including risk reduction activities)
  - FIC Integration
  - Necessary resources and schedule

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Key Discussion Areas for PES

1. **Project Summary:** background including relationship between this proposal and other Projects or Products.
2. **Project Factors:** key risks, drivers and other factors that will shape the PES.
3. **Acquisition Strategy:** describes the Acquisition Strategy alternatives and rationale for the preferred Strategy.
4. **Sustainment Strategy:** describes the Sustainment Strategy alternatives and rationale for the preferred Strategy.
5. **Approval Strategy:** wrt Gates and Government approvals …
Key Discussion Areas for PES

6. Project Management
   – Key Information Gathering Activities (including risk mitigation activities)
   – Resources (including enabling budget for delivery groups)
   – FIC Integration: Governance bodies, roles and responsibilities
   – Schedule

1. Project Summary
   • Relationships with other Programs, Projects and Products.
   • How long the capability is expected to be in service (Life of Type).
   • High-level view of the resources and the years of the expenditure.
   • Key schedule dates including approval schedule (consideration at Gates) and introduction into service timeline (IOC and FOC).
   • Governance ie Capability Manager, Program Sponsor, Program Manager, Project Sponsor, Delivery Div/Group.
2. Project Factors

• The Project Risk and Drivers profile for a project/proposal is determined in accordance with the Smart Buyer Decision Making Framework and categories.

• The profile provided in the PES includes potential actions in response to key risk or drivers.

• Project risk profile reflecting residual risk.

• Potential actions can suggest particular strategies and/or inform implementation plans.

Smart Buyer ‘Risk and Drivers’ categories

• Acquisition
  – Requirements
  – Technology
  – Schedule
  – Commercial
  – Project Integration
  – Defence Integration
  – Financial
  – Strategic
  – Industry

• Sustainment
  – In-Service Requirements
  – Obsolescence
  – Commercial
  – FIC
  – Financial
  – Strategic
  – Operational
  – Industry

For each Project/Proposal these are rated as High, Medium-High, Medium-Low or Low
Examples of factors that shape Strategies

• Factors that shape strategies include but are not limited to:
• Risk and Driver profile (incl extent of risk mitigation activities)
• Acquisition and support budget limitations
• Competitive environment & leverage for Commonwealth
• Reduced Defence workforce
• Planned Withdrawal Date (PWD) of current assets
• Costs of Tendering for Industry and Commonwealth
• Extant source selection outcomes for similar systems
• Australian industry participation
• Schedule certainty

3. Acquisition Strategies

• The PES will include assessment of the advantages and disadvantages for each of the strategy alternatives considered
• Examples of Acquisition Strategies include but are not limited to:
  – Fast to Contract drawing on Maximum (Open) Competition
  – Early down-selection
  – Staged Acquisition
4. Sustainment Strategies

- Examples of Sustainment Strategies include but are not limited to:
  - In-house/Outsource Hybrid
  - Maximum Outsourced Support Solution
- Areas of consideration for Sustainment Strategies include but are not limited to:
  - cost and ability to support preparedness requirements
  - necessary engineering support
  - different levels of maintenance
  - supply support (including stores and distribution)
  - training support

5. Approvals Strategy

- Interim Capability Life Cycle Manual requires tailoring of the Approvals Strategy
- Risk-Based Approach to Defence Investment Approvals Framework considers four categories of risk:
  - Finance
  - Requirements
  - Technical and Integration
  - Industrial and Strategic
- Example of Approval Strategy as a result of this tailoring approach includes simple projects with no significant risks or decisions required from Government:
  - can proceed directly from Gate 0 to Gate 2
  - can be approved by Minister for Defence and Minister for Finance, rather than going to NSC
Business Case

CLC Business Case – Overview

- Clearly defines the gap or opportunity – bounding the problem.
- Describes how the option set for closing the gap, has been narrowed, including removal of infeasible solutions.
- Contains a preliminary assessment of the financial resources that the Investment Committee is prepared to commit in order to acquire and sustain the capability.
- CM develops the Gate 0 Business Case supported by the Delivery Group and manages its progression to the Investment Committee.
CLC Business Case – Overview

- Investment Proposal is a proposal to expend funds on a Project or Program. It is articulated by Business Case consisting of a JCNS and a PES.
- Purpose of the Business Case is to provide a sufficient argument for the Investment Proposal and a strategy for its implementation.
- Business Case is the decision document presented at CLC gates, based upon the Five Case Model, where Strategic, Economic, Commercial, Financial and Management Cases.
- Business Case is presented at Gate 0 and presented with Submissions at Gates 1 and 2.

CLC Business Case

- “Business Case presents an argument which demonstrates that the benefits or outcomes are worth the commitment of the planned resources (funds, people, time)”.

  Defence CLC Seminar Feb 2017

- Business Case details how capability options fit within both the Program and the Capability Stream.
- Highlights the strategic logic of options and risks to the Program and Capability Stream if capabilities not developed.
- Ensures future requirements do not extend beyond strategic need.
Summary of Five ‘Cases’

- **Strategic Case:** Proposal aligns with strategic intent and priorities.
- **Economic Case:** Consideration of options and value proposition for the proposed investment is sound.
- **Financial Case:** Resourcing provisions are addressed.
- **Commercial Case:** Requirements, execution strategy including acquisition and sustainment strategy, risk.
- **Management Case:** Management arrangements.

Gate 0 Business Case

- **Gate 0 Business Case** is presented to the Investment Committee by the Capability Manager to inform an investment decision and identifies a set of feasible and achievable options.
- The purpose of the Gate 0 Business Case is to provide a sufficient argument for the Investment Proposal and a strategy for its implementation.
- Level of detail in the Gate 0 Business Case is determined by the level of complexity of the proposal.
Gate 1 Submission

- Decision making at Gate 1 is based around the government submission.
- The Submission is prepared by CM and summarises the Business Case which:
  - focuses on the risk treatment activities that have taken place since Gate 0
  - describes progress in reducing options
  - defines the requirements statement
  - outlines the plan and risk mitigation activities to progress to Gate 2.

Gate 1 Submission

- The Business Case and Submission includes:
  - assessment of risk
  - initial independently tested cost and schedule estimates
  - TEMP
  - IPMP and stage plan to progress to Gate 2.
The Capability Life Cycle (CLC) and Capability Management Practices

Gate 2 Submission

- Decision making at Gate 2 is based around a single Gate 2 Business Case, which forms the basis of the proposal to government for approval.
- The CM is responsible for producing the Gate 2 submission which is informed by the Business Case signed off jointly by the CM and the Delivery Group.
- The submission is reviewed by Contestability Division and any contestability advice on outstanding issues is embedded into the submission.
- The Business Case includes detail within which the IPMT is authorised to negotiate a contract post Gate 2.

The final submission and business case includes:

1. residual risk and mitigation plans for that risk
2. confirmation that investment satisfies Defence policy and priorities, and is value for money
3. schedule, whole of life costing and approval limit
4. updated TEMP
5. analysis of preferred contractor and summary of intended contractual terms.
Better Business Case Framework

Better Business Case

- Defence CLC Business Case development is based on Better Business Case (BBC) framework as described on the NZ Treasury website (http://www.treasury.govt.nz)
- Better Business Cases (BBC) is a systematic method which is used to develop business cases for programmes or projects.
- The benefits of BBC are that each of the key aspects of a robust investment proposal are explicitly and systematically addressed through five distinct cases

Source: http://www.treasury.govt.nz/statesector/investmentmanagement/plan/bbc/framework
The Capability Life Cycle (CLC) and Capability Management Practices

Better Business Case

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Source: http://www.treasury.govt.nz/statesector/investmentmanagement/plan/bbc/framework

Better Business Case

- **Strategic Case:** provides a compelling case for change and ensures a strategic fit and meets business needs.
- **Economic Case:** Demonstrates that the preferred option optimises value for money.
- **Financial Case:** confirms that the proposal is affordable within available funding.
- **Commercial Case:** confirms that the proposal is commercially viable.
- **Management Case:** demonstrates that the proposal is achievable and can be successfully delivered.

Source: http://www.treasury.govt.nz/statesector/investmentmanagement/plan/bbc/framework
Better Business Case

The five Better Business Case components have been applied to the structure adopted for CLC Business Case:

- **Strategic Case:** Presents the argument that proposal aligns with strategic (capability and business) intent and is consistent with priorities. It includes the description of strategic risks, issues, and constraints relevant to the proposal. This case is satisfied by the JCNS.

- **Economic Case:** Presents the argument on the method, considerations, and rationale used to select the options. This case is also satisfied by the JCNS.

Source: Defence VCDF website

Better Business Case

- **Financial, Commercial and Management Cases:** are addressed through:
  - Proposal of detailed risk-based tailored Project Execution Strategy
  - Proposal of resources needed timeframes and outcomes required to reach the next Gate. This aspect is also captured in the PES.

Source: Defence VCDF website
Strategic Case – JCNS
Argument that proposal aligns with strategic (capability and business) intent and is consistent with priorities:

• A short statement of decisions being sought from VCDF.
• If Project already in IIP then need is reconfirmed if there has been change to strategic landscape, otherwise just restated.
• Capability Need and the Investment Proposal is justified within context of Defence strategic landscape and identified Portfolio and Program priorities.
• ...

Source: Defence VCDF website

Strategic Case – JCNS
Argument that proposal aligns with strategic (capability and business) intent and is consistent with priorities:

• ...
• Scope of Capability Need is agreed in terms of capability objectives, outcomes, and requirements.
• Proposal fits in with other relevant strategic ‘business’ intentions eg ICT roadmap
• Value Proposition: the overall Investment Proposal, as known at the time, represents value to Defence outcomes relative to other investments.

Source: Defence VCDF website
Strategic Case – JCNS
Description of strategic risks, issues, and constraints relevant to the proposal:

- Is the expected financial allocation to get to the next Gate affordable and consistent with Defence priorities (informed by Smart Buyer Risk Analysis, Joint Capability Needs Statement and Program Strategy):
- Consistent with due diligence obligations identify risks, issues and opportunities for the overall proposal
- Constraints that will impact option selection and implementation e.g. enablers, resources.
- Dependencies and potential impacts on other parts of Defence, industry etc.
- Stakeholders are identified and key interests understood

Source: Defence VCDF website

Economic Case – JCNS
Presents the argument on the method, considerations, and rationale used to select the options:

- Critical Success Factors which have been used to evaluate the options including key factors
- Value proposition of each option (value for money if information available)
- Supplier capacity and capability (market analysis)
- Potential affordability and achievability
- For a direct to Gate 2 proposal, the options considered, the short-listing, and rationale for the preferred option/s. The Value Proposition of each option is described.
- Where options require further development the argument is presented here for a Gate 1 decision.

Source: Defence VCDF website
Financial, Commercial, Mgt Cases – PES

Proposal of detailed risk-based tailored PES based on Smart Buyer Framework for preferred option/s:
- Tailored approval Pathway for Gates, decision delegations, time-bounding and plan (to next Gate);
- Tailored Acquisition and Sustainment Strategy including Industry Engagement and solicitation method
- Risk Reduction activities that address program and project risks consistent with the IC’s risk appetite
- ...

Source: Defence VCDF website
The Capability Life Cycle (CLC) and Capability Management Practices

Financial, Commercial, Mgt Cases – PES

Proposal of resources needed, timeframes and outcomes required to reach the next Gate:

- resources required to reach the next Gate based on the PES are justified and available for implementation including
- cost of risk reduction activities and all other project costs to reach the next Gate.
- Agreement to schedule to next Gate
- Project delivery Workforce
- Specific information needed for decisions on proposal including: Guidance from VCDF on escalation criteria and thresholds for return to IC.

Source: Defence VCDF website

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Business Case Guide: Tailored for particular gate based upon sufficiency of information required for decision

Source: Defence VCDF website
Integrated Project Management Plan
(IPMP)

- The IPMP is the detailed plan to introduce the capability into service.
- The Integrated Project Management Plan evolves into an Integrated Product Management Plan as the capability approaches introduction into service and transitions into product management under the appropriate Program.

IPMP – Key Points

• Details activities and resources needed to satisfy the selected strategy documented in the PES.
• Demonstrates that the selected strategy described can be implemented within budget, schedule, quality and risk.
• Provides the basis for subordinate plans eg Systems Engineering Management Plan (SEMP).
• Includes the Integrated Master Schedule (IMS).

Source: IPMP Guide

IPMP – Key Points

• High-level definition of products, activities (including sequencing and dependencies) and resources needed to implement the PES.
• Used as a common reference (enabling shared understanding and coordinated realisation) by:
  – Sponsor
  – FIC Providers
  – CASG Line Management
  – Project Office staff
• Demonstrates the feasibility of the selected strategy ie:
  – can be implemented within budget, schedule, quality (incl scope) constraints; and
  – the risks are manageable and acceptable.

Source: IPMP Guide
The Capability Life Cycle (CLC) and Capability Management Practices

**IPMP – Key Points**

- Basis for coordinated realisation of the capability identifying deliverables, schedule, dependencies and risks.
- Defines the major management control/decision points (i.e. stages) within the project.
- Defines major products and outcomes within each stage and activities and resources required to produce them at an acceptable level of risk.

Source: IPMP Guide

---

**IPMP – Key Points**

- Sufficient detail to enable management and be easily understood by key stakeholders:
  - understand each of the products required (including intermediate products);
  - the dependencies between FIC elements and between FIC providers;
  - who is to provide each product;
  - when and where each product is to be provided; and
  - the quality attributes of each product.

- Includes the IMS which is the highest level definition of schedule detailing activity timings, dependencies, and necessary resources.

Source: IPMP Guide
**FIC Integration as part of the IPMP**

- Coordination and integration of FIC elements ensures a seamless transition into service of the capability and achieve IOC and FOC on time and on budget.
- Dependencies between FIC activities and deliverables become milestones in the IPMP and IMS against which each FIC provider can report progress.

Source: IPMP Guide

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**FIC Providers as part of the IPT**

- The FIC provider’s role is to cooperatively participate in the IPT for the joint planning and realisation of the capability in accordance with the Project Directive.
- FIC Providers are expected to:
  - manage their respective tasks, milestone achievement, financial expenditure, contracting and procurement under their respective management and business processes.
  - regularly status their work and provide the IPM and Sponsor early warning of any issues including proposed corrective actions
  - use an escalation process to the appropriate steering group for issues that exceed the level of experience or authority of the IPM or FIC provider

Source: IPMP Guide
Integrated Project Manager (IPM)

- The IPM is expected to:
  - Work with FIC providers to identify FIC element deliverables for the project (i.e. what, where and when);
  - Identify dependencies among FIC elements (e.g. flow down of requirements);
  - Gain the commitment of each FIC Element provider to deliverables and timeframes for which they are responsible;
  - …

Source: IPMP Guide

Integrated Project Manager (IPM)

- The IPM is expected to:
  - …
  - Meet regularly with all FIC providers and required enablers in the spirit of open and collaborative communications to consider integration risks and issues;
  - Continually assess the impact of baseline milestone movements on the project’s IOC and FOC milestones for all FIC providers; and
  - Escalate issues to the Sponsor or Steering Group as appropriate.

Source: IPMP Guide
The Capability Life Cycle (CLC) and Capability Management Practices

Integrated Project Team (IPT)

- The Integrated Project Team (IPT) coordinates the FIC elements required to realise the capability.
- Following Gate 0 approval, Projects may be overseen by a Capability Program Steering Group (CPSG) which enables joint consideration and decision-making of FIC.
- An IPM designate and minimum support resources (e.g., commercial manager and engineering resources) can be appointed prior to Gate 0 to support Gate 0 documentation.
- Integrated Project Team (IPT) is to be established including Program & Project Sponsor, Integrated Project Manager (IPM) and FIC representatives in a governance model.

Source: IPMP Guide

IPMP Structure

Section 1. Project Summary
Section 2. IPMP Authority
Section 3. IPMP Maintenance
Section 4. Project Execution Strategy Summary
Section 5. Project Management Approach
...
The Capability Life Cycle (CLC) and Capability Management Practices

IPMP Structure

... 
Annex A  Project Management Planning Guidance
Annex B  Engineering Planning Guidance
Annex C  Sustainment Planning Guidance
Annex D  Commercial Planning Guidance
Annex E  Acceptance in Operational Service Planning Guidance
Annex F  Project Office Management

Source: IPMP Template

Section 1. Project Summary

• IIP Value
• Project Staffing
• Schedule Summary
  – Gate 0
  – Gate 1
  – Gate 2
  – Prime Contract Effective Date
  – Initial Operating Capability (IOC)
  – Final Operating Capability (FOC)
• Capability Manager, Program Sponsor, Program Manager, Project Sponsor, User Representatives, Delivery Group

Source: IPMP Template
Section 2. IPMP Authority

- Identify authority of PES ie when PES approved, relevant Gate etc.
- Confirm traceability of IPMP to the strategies identified in the PES and the need to maintain control over this relationship including approval and management arrangement of deviation.
- Identify FIC providers and key responsibilities.
- Identify consultation in development of this plan.

Source: IPMP Template

Section 3. IPMP Maintenance

- Identify the revision expectations for the IPMP eg following key milestones eg following solicitation outcomes

Source: IPMP Template
Section 4. PES Summary

• **Scope**

• **FIC**: summarise the FIC elements, capability baselines and broad responsibilities to be coordinated to realise the capability.

• **Major Factors**: factors influencing the PES and the Project Management Approach
  - Acquisition Strategy
  - Sustainment Strategy
  - Transition to Sustainment
  - Acceptance into Service
  - Closure

Source: IPMP Template

Section 5. Project Management Approach

5.1 Governance
5.2 Assurance
5.3 Major Activities
5.4 Budget
5.5 Coordination and Control
5.6 Stakeholders
5.7 Engineering Approach
5.8 Sustainment Approach
5.9 Commercial Approach
5.10 Project Office Management

Source: IPMP Template
Annex A: PM Planning Guidance

A.1 Project Governance
A.2 Project Assurance
A.3 Stage / Detailed Planning
A.4 Project Work Breakdown Structure
A.5 Integrated Master Schedule
A.6 Integrated Project Team
A.7 Battle Rhythm
A.8 Risk and Contingency Management
A.9 Issue Management
A.10 Stakeholder Management
A.11 Transition to Sustainment
A.12 Acceptance into Operational Service
A.13 Project Closure

Source: IPMP Template

Annex B: Engineering Planning Guidance

- Consult with the CASG Engineering and Technical Centre of Expertise to define an engineering approach appropriate for the Project.

- Areas to be defined:
  B.1 Technical Objectives
  B.2 Engineering Organisation and Responsibilities
  B.3 Technical Risks and Mitigations
  B.4 Technical Activities

Source: IPMP Template
Annex C: Sustainment Planning Guidance

- Consult with the CASG Materiel Logistics Centre of Expertise to define a sustainment approach appropriate for the Project.
- Areas to be defined:
  C.1 Sustainment Objectives
  C.2 Sustainment Organisation and Responsibilities
  C.3 Sustainment Risks and Mitigations
  C.4 Sustainment Activities

Source: IPMP Template

Annex D: Commercial Planning Guidance

- Consult with the CASG Commercial Centre of Expertise to define a commercial approach appropriate for the Project.
- Areas to be defined:
  D.1 Commercial Objectives
  D.2 Commercial Organisation and Responsibilities
  D.3 Commercial Risks and Mitigations
  D.4 Commercial Activities

Source: IPMP Template
Annex E: Acceptance into Operational Service Planning Guidance

- This Annex should be prepared in close consultation with, or by, the Capability Manager representatives and Sponsor.

- Areas to be defined:
  E.1 Capability Baselines
  E.2 Basis of Provisioning
  E.3 Facility and Training Area Needs

Source: IPMP Template

Annex F: Project Office Management

- Consult with the CASG Program Management Centre of Expertise to define a project office management approach appropriate for the Project.

- Areas to be defined:
  F.1 Organisation
  F.2 Roles and Responsibilities
  F.3 Decision Making Processes
  F.4 Configuration and Data Management
  F.5 Quality Management
  F.6 Security
  F.7 Work Health & Safety and Environment Management

Source: IPMP Template
The Capability Life Cycle (CLC) and Capability Management Practices

### Needs & Requirements Artefacts

**What and Why**

- Defence White Paper
- DPG
- AMS
- IIP
- Strategic Guidance
- Force Design
  - FOE
  - JCF
  - AJOC
  - FJOC
- Concepts
- JCN

**How**

- PGPA Act
- CPRs
- DIP
- Smartbuyer
- DPPM

Raised within Force Design as Program level direction

- CPN
- PIOC

Issued by JCA to the CM

#### Program

- JCNS
  - Proposal = Sponsor’s Paper/JCNs/PES
  - OCD
  - FPS 1
  - FPS 2

- PES
  - Project WBS
  - IPMP
  - IMS

#### Product

- Tender and Contracting Documents

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**Capability Definition Documents (CDD)**
Capability Definition Documents (CDD)

- Operational Concept Document (OCD)
- Function and Performance Specification (FPS)
- Test and Evaluation Master Plan (TEMP)

Requirements - FPR

- The First Principles Review (FPR) states that the “creation and management of requirements has become cumbersome, complex and inefficient…The setting of needs and requirements is poor with priority given to single Service needs over joint projects.”
- Improvements to Requirements Development should address:
  - Use of common references ie Program-level references
  - Sufficiency through tailoring to the circumstances
  - explicitly include requirements for:
    - integration and interoperability
    - All FIC
    - Realisation of capability
Benefits of good requirements

- Sound Requirements are needed to:
  - Inform trade off decisions (options);
  - Form the basis of estimates;
  - Provide transparency and traceability; and
  - Enable management of residual gaps when acquiring off-the-shelf (OTS) solutions.
- Requirements development practices using Program-level needs and requirements information supports FPR and CLC expectations of sufficiency through use of common references and re-use.

Needs and Requirements Hierarchy under CLC
Program level supports sufficiency goal

Requirements development practices using Program-level needs and requirements information supports FPR and CLC expectations of sufficiency through use of common references and re-use

Needs & Requirements Re-use

Program Integrating Operational Concept (PIOC)

Sections 1-4
- OCD

Sections 5-6
- FPS
- TCD

Needs and Requirements Re-use

Needs and Requirements developed specifically for Project
Capability Definition Documents (CDD)

- CDD provides definition of Needs and Requirements as a critical foundation for the whole capability life cycle.
- Requirements must be properly developed and accessible throughout the CLC.
- Requirements development and maturing definition is core to risk reduction across the life cycle. It underpins greater fidelity of cost, schedule, risk definition. Greater fidelity enables greater certainty of estimates.
- Capability baselines must continue to be visible as they reflect Government endorsed requirements.

Capability Definition Documents (CDD)

- The Operational Concept Document (OCD) is the capstone document that captures the scope of, and intent for, the proposed Capability.
- The Function and Performance Specification (FPS) specifies the formal requirements for the Materiel System and provides the basis for design and qualification testing of the system.
- The T&E Master Plan (TEMP) considers T&E requirements within the life-cycle management of the Capability System. The TEMP is elaborated further by the contractor in the V&V Plan.
Transformation of Operational Needs

OCD, FPS, TEMP Relationship

Needs Hierarchy
- Mission
- Level 1
  - 1
  - 1.1
  - 1.1.1
  - 1.1.1.1
  - …
- Level 2
  - 1.2
  - 1.1.2
  - 1.1.1.2
  - …
- Level 3
  - 1.n
  - 1.1.n
  - 1.1.1.n
  - …
- Level 4
  - …
- Level n

Measures Hierarchy
- 0
  - 1
  - 2
  - …
  - n
  - n.1
  - n.2
  - …
  - n.n
  - n.n.1
  - n.n.2
  - …
  - n.n.n
- CI
- COI
- MOE
- MOP
- TPM

Prepared by Stakeholders (CM)
The Capability Life Cycle (CLC) and Capability Management Practices

OCD, FPS, TEMP Relationship

Needs Hierarchy

- Mission
  - Level 1
  - Level 2
    - Level 3
    - Level 4
      - Level n

Measures Hierarchy

- CI
- COI
- MOE
- MOP
- TPM

Augmented/prepared by Acquirer (CASG)

OCD, FPS, TCD Relationship

Needs Hierarchy

- Mission
  - Level 1
  - Level 2
    - Level 3
    - Level 4
      - Level n

Measures Hierarchy

- CI
- COI
- MOE
- MOP
- TPM

Prepared by Contractor/Sub-contractors
The Capability Life Cycle (CLC) and Capability Management Practices

OCD

- Communicates the solution-independent needs of the warfighter to all stakeholders, including acquirers and developers, in a language that all parties can understand.
- Describes capability from an operational perspective.
- Facilitates an understanding of the overall system goals for the materiel system.
- Details missions and scenarios associated with operations and support of the Materiel System.
- Provides a reference for determining ‘fitness for purpose’.
- Provides a justifiable basis for the formal requirements for the Materiel System, as captured in the FPS.
- Details the FIC needed to realise the Capability System in operational service.

OCD Template

0. EXECUTIVE SUMMARY
0.1 Identification and Justification
0.2 Key Boundary Issues
0.3 Project Schedule
0.4 Capability System Mission and Critical Operational Issues
0.5 Existing Capability Description
0.6 Materiel System Solution-class
0.7 Fundamental Inputs to Capability

1. SCOPE
1.1 Capability Identification
1.2 Document Purpose & Intended Audience
1.3 Justification for Capability
1.4 System Boundary and Acquisition Assumptions
1.5 Key Timeframes for Capability

2. DEFINITIONS AND REFERENCED DOCUMENTS
2.1 Referenced Documents
2.2 Glossary of Terms

3. SOLUTION-INDEPENDENT CAPABILITY NEEDS
3.1 Mission Overview
3.2 Operational Policies and Doctrine
3.3 Capability System End-user classes
3.4 Summary of Operational Scenarios
3.4.1 Common Scenario Attributes
3.4.2 Scenario 1 - Scenario Title
3.4.2.1 Summary of Situation
3.4.2.2 Summary of Military Response
3.4.3 Scenario 2 - Scenario Title
3.4.4 Scenario N - Scenario Title
3.4.5 Summary of Consolidated Operational Needs
3.4.6 Solution-class-Independent Constraints
The Capability Life Cycle (CLC) and Capability Management Practices

OCD Template

4. EXISTING SYSTEM
4.1 Existing System Overview
4.2 Existing System Operational Capability Comparison
4.3 Existing System Internal Shortcomings
4.4 Existing System Planned or Active Upgrades
4.5 Existing System Internal User classes
4.6 Existing System Internal Functionality
4.7 Summary of Existing System Internal Scenarios

5. SYSTEM SOLUTION-CLASS DESCRIPTION
5.1 Materiel System Description
5.2 Mission System Architecture
5.3 Materiel System Interfaces
5.4 Materiel System Internal User classes
5.5 Materiel System Functionality and Performance
5.6 Materiel System Support Concepts and Requirements
5.7 Materiel System Constraints
5.8 Materiel System Evolution and Technology Forecast
5.9 Summary of Materiel System Internal Scenarios
5.9.1 Internal Scenario 1 - ‘A Typical Day’s Operation’
5.9.1.1 Summary of Situation
5.9.1.2 Summary of Process Flows and Interactions
5.9.1.3 Summary of Materiel System Requirements
5.9.2 Internal Scenario 2 - Scenario Title
5.9.3 Internal Scenario N - Scenario Title

6. CONSOLIDATED FUNDAMENTAL INPUTS TO CAPABILITY (FIC) REQUIREMENTS
6.1 FIC Related Guidance
6.2 Major Systems FIC Element Requirements
6.3 Facilities and Training Areas FIC Element Requirements
6.4 Support FIC Element Requirements
6.5 Supplies FIC Element Requirements
6.6 Organisation FIC Element Requirements
6.7 Command and Management FIC Element Requirements
6.8 Personnel FIC Element Requirements
6.9 Collective Training FIC Element Requirements
6.10 Industry FIC Elements Requirements
6.11 FIC Impacts on Supporting Capabilities
6.12 Summary of Overall FIC Responsibilities
6.13 FIC Development Forecast

A. ANNEX A - EXTERNAL SCENARIOS
A.1 Capability System Operational Scenarios
A.1.1 Common Scenario Attributes
A.1.2 Scenario 1 - Scenario Title
A.1.2.1 Scenario 1 - Situation Requiring ADF Action
A.1.2.2 Scenario 1 - Military Response
A.1.2.3 Scenario 1 - Operational Needs
A.1.3 Operational Scenario 2 - Scenario Title
A.1.4 Operational Scenario N - Scenario Title
A.2 Consolidated Operational Needs
The Capability Life Cycle (CLC) and Capability Management Practices

OCD Template

B. ANNEX B - EXISTING SYSTEM INTERNAL SCENARIOS

B.1 Internal Scenario 1 - ‘A Typical Day’s Operation’
B.1.1 Internal Scenario 1 - Situation
B.1.2 Internal Scenario 1 - Details of Process Flows and Interactions
B.1.3 Internal Scenario 1 - Identified Shortcomings
B.2 Internal Scenario 2 - Scenario Title
B.3 Internal Scenario N - Scenario Title

C. ANNEX C - MATERIEL SYSTEM INTERNAL SCENARIOS

C.1 Internal Scenario 1 - ‘A Typical Day’s Operation’
C.1.1 Internal Scenario 1 - Situation
C.1.2 Internal Scenario 1 - Details of Process Flows and Interactions
C.1.3 Internal Scenario 1 - Materiel System Requirements
C.2 Internal Scenario 2 - Scenario Title
C.3 Internal Scenario N - Scenario Title
C.4 Consolidated Materiel System Functionality and Performance

FPS

• Specifies formal requirements for the Materiel System.

• Provides the basis for design and qualification testing of the system.

• Provides the vehicle for the capture of formal, verifiable and unambiguous requirements, ‘distilled’ from the OCD.

• Is intentionally written using formal language, with all requirements in the FPS traceable to needs in the OCD.

• Addresses the total Materiel System, but will later be developed into a Mission System specification and a Support System specification, usually by a prime contractor or prime system integrator.

• FPS requirements may also need to be decomposed and/or allocated for the purposes of individual acquisition contracts.
The Capability Life Cycle (CLC) and Capability Management Practices

Develop OCD, FPS, and TEMP

1. Define Capability System context and background
2. Define Capability System needs (independent of Solution class)
3. Describe relevant Existing System capability
4. Define Material System & FIC requirements (dependent on Solution class)
5. Maintain OCD, FPS & TEMP over life of Capability System

CDD Guide v2.0
OCD Section

(1 & 2) (3) (4) (5/6)
The Capability Life Cycle (CLC) and Capability Management Practices

Develop OCD, FPS, and TEMP

OCD Section

1 to 3

4

5/6

1. Define Capability System context and background
2. Define Capability System needs (independent of Solution Class)
3. Describe relevant existing system capability
4. Define material system & FC requirements (dependent on solution class)
5. Maintain OCD, FPS & TEMP over life of capability system

What do we need?

What do we have?

What can we do?

Is everything still OK?

Define CS Context and Background

- Define Capability System context and background
- Define Capability System needs (independent of Solution Class)
- Describe relevant existing system capability
- Define material system & FC requirements (dependent on solution class)
- Maintain OCD, FPS & TEMP over life of capability system

Identify capability

Identify stakeholders

Identify capability rationale

Identify key functional areas for capability capability

Identify plan and priority for technical objectives

Identify operational and technical objectives

Establish and maintain library and list of referenced documents

1.1

1.2

1.3

1.4

1.5

1.6

1.7

1.8
The Capability Life Cycle (CLC) and Capability Management Practices

Define Capability System Needs

1. Identify all End-user classes
2. Describe current operational scenarios
3. Network operational needs for each business process step
4. Capture and model business/operational processes of End-user
5. Extract operational needs for each business process step
6. Prioritize Capability System needs for each Operational Scenario and End-user class
7. Prioritize Capability System needs, (solution-class-independent)

Describe Existing System Capability

1. Describe current operational scenarios
2. Network operational needs for each business process step
3. Capture and model business/operational processes of End-user
4. Extract operational needs for each business process step
5. Prioritize Capability System needs, (solution-class-independent)
6. Prioritize Capability System needs, (solution-class-independent)
7. Describe current operational scenarios
8. Network operational needs for each business process step
9. Capture and model business/operational processes of End-user
10. Extract operational needs for each business process step
11. Prioritize Capability System needs, (solution-class-independent)
12. Prioritize Capability System needs, (solution-class-independent)
Define Materiel System Requirements

Selected Important Activities
1.2 Identify Stakeholders

- Strictly speaking, a stakeholder could be defined as someone who has a stake in the project—that is, someone who is affected by the system in some way, or can affect the system in some way.

- More usefully, a stakeholder is defined as someone (or some organisation) who has a right to influence the outcome of the system, rather than someone who is simply affected by the system.
1.2 Identify Stakeholders

- Even our better definition does not assist us to identify our stakeholders automatically. If a stakeholder has a right to influence the requirements, we need to identify what or who gives them that right. Even then, we need to examine candidate stakeholders more carefully. For example:
  - Do all stakeholders have equal rights?
  - If not, who decides which have higher priority?
  - What do we do if stakeholders do not agree?
  - If a group of people is considered to be a stakeholder, do they all have a voice, or is a spokesperson to be elected/nominated?
  - How do we discount requirements collected from a stakeholder who is clearly confused and whose contributions are unenlightening?

1.2 Identify Stakeholders

- Identifying stakeholders is not just a matter of simply listing those who have a stake in the project. This step has a number of activities:
  - Ensure that there is a business owner.
  - Identify all candidate stakeholders (anyone affected by the system or able to affect it).
  - Evaluate candidates and select stakeholders.
  - Understand roles, responsibilities, and interrelationships of stakeholders and stakeholder groups.
  - Identify a stakeholder representative (an individual) for each stakeholder group.
  - Prioritise stakeholders.
  - Develop stakeholder management strategies.
  - Prepare Stakeholder Management Plan (SMP).
Someone to Own the Process

- In the context of a particular system development, someone must have sufficient authority to be able to endorse the Stakeholder Management Plan, to confirm stakeholder representatives, agree priorities, and so on.
- They must also have sufficient authority to settle disputes.
- Without such an owner of the process, very few of the necessary trade-offs will be able to be made during the requirements engineering process.
- The business owner is also commonly referred to as the project champion, or business owner.
- The business owner may be a group of individuals who would form a stakeholder board (in which case, a chair person is required to arbitrate and to act as the business owner).

Someone to Own the Process

- In this key role, the business owner:
  - nominates stakeholders;
  - allocates stakeholder rights and priorities;
  - manages the elicitation process;
  - arbitrates stakeholder conflict and makes hard decisions where necessary;
  - provides the conduit between the business (the business case) and the project (particularly the requirements engineering effort);
  - negotiates resources on behalf of the project;
  - protects the project from any vagaries of the business environment; and
  - manages stakeholder and business expectations.
1.4 Identify CS Boundaries

Context Diagrams

- To assist with bounding the system, a tool called a context diagram may be used to illustrate the related systems, relevant regulatory environments, stakeholders, external systems, interfaces, and so on.
- Different systems may of course have significantly different context diagrams.
This is NOT a Context Diagram

How does this system fit in with the rest of the world?

System Under Consideration

Context Diagram

- Police
- Neighbours
- Environment
- Resident
- Monitoring Agent
- Monitoring System
- PSTN
- Alarm System
- Power System
- House System
- Intruder
- Power Point
- Power Distribution Subsystem
- Power Entry Panel
- Power Grid
Consider External Interfaces

• Interfaces with existing or future external systems must also be defined as these will place considerable requirements on the system under development.

• While these external systems are not directly related to the system, the success of the fielded system is often determined by its ability to interface to its external environment.

• For example, while it is possible to build a perfectly functional aircraft without consideration of air traffic control regulations, the aircraft would be useless because it would not be allowed to operate.

Consider External Interfaces

• The definition of an interface requires considerably more detail than simply identifying and naming the interface. Broadly there are three main steps in interface definition:
  – **Interface Description.** The interface is given a name, short title and identifier. The nature of the interface is described in terms of who, what, when, where, why, how.
  – **Interface Impact Analysis.** The interface is analysed in terms of its impact on the system. In particular, any constraints imposed by the system are identified. A risk analysis is conducted to determine the impact of the interface on the operation and design of the system.
  – **Interface Control Analysis.** Each external interface must be analysed to determine the extent to which it can be controlled so that designers and operators of the system are not at the mercy of its external interfaces.
Consider External Interfaces

- Once it has been defined, each interface has to be documented and managed. Interface management is very important because systems (and the projects that deliver them, for that matter) often live or die by their interfaces. This is even more evident in modern systems where the sheer number of interfaces and their complexity are a significant source of risk in system development.

- The definition of a system’s external interfaces assists in defining the system’s scope—interface management is therefore an important part of the scope management activities undertaken by the project manager. It is highly likely that the scope of a system would be affected should there be a change to any aspect of a system’s external interfaces throughout its development.
1.6 Identify Mission Objectives

Identify Mission (and Operational Needs)

- Because the user has most probably stated the mission for the system in a fairly general way, every project should begin with a concise statement of the mission, elaborated by statements of the system-level needs.

- The mission statement is then expanded and qualified by short declarative statements of the system operational needs (best expressed in a functional hierarchy).

- Level 1 Operational Needs are normally relatively broad, each of which spawns a number of more-specific Level 2 Operational Needs, each of which spawns a number of more-specific Level 3 Operational Needs, and so on.

- Level 3 or 4 is sufficient for the OCD—lower level needs spawn system requirements in the FPS (and subsequently in the SS and then the SSS).
Secondary Missions

- Secondary mission objectives can be considered on the assumption that the Capability System will eventually be in place. These secondary objectives take advantage of the existence of this Capability System, given that, without it, they would have to be satisfied in another way.

- For example, an air-to-air refueller platform may have a secondary mission objective as a communications relay. If the refuelling role did not exist, the communications-relay capability may be achieved by some other means, such as a suitably equipped unmanned aerial vehicle.

1.7 Identify Policies and Doctrine
1.7 Identify Policies and Doctrine

- Identify operational and policies such as:
  - international treaties;
  - agreements regarding operation in international waters or airspace;
  - compliance with environmental, heritage, and land rights legislation;
  - compliance with spectrum management regulations;
  - doctrine relating to the primary and secondary missions; and
  - interoperability requirements, which may be considered here, but are usually considered as part of the derivation of the operational needs and solution-class requirements.

- We discuss these in more detail later as enterprise constraints.

18 Glossary and Referenced Documents
1.8 Glossary and Referenced Documents

- The aim of this step is to initially create and then maintain a glossary of defined terms and acronyms, and a list of referenced documents. The set of terms used in each of the OCD, FPS and TEMP may not always overlap, but wherever common terms and documents are referenced, the terminology and references should be the same.

- A project-wide integrated dictionary should be established, consisting of both a glossary of terms and acronyms and a list of referenced documents. A filtered set of this dictionary should be incorporated into the OCD and other CDD, as applicable.
2.1 Identify all End-user Classes

- The aim of this step is to identify all the End-user classes (End-users that have a common set of needs) in conjunction with establishing the scenarios for the Capability System.
- This step is typically iterative because the identification of an End-user class may require additional operational scenarios (next step) in which they appear, and vice-versa.
- The set of End-user classes should identify the people who are external to the ‘black box’ Capability System and who are the End-users of the system products or capabilities.
- The roles and needs of people inside the Capability System (Internal Users), such as operators, maintainers and trainers, is addressed later (in Section 5.4), during preparation of the internal, solution-class-dependent description.
2.2 Select Operational Scenarios

Once the mission and high-level operational needs have been articulated, the top-down process is continued through an examination of the range of operational scenarios that the stakeholders propose for the system.

The examination begins with a description of the general operational environment for the system to identify all of the environmental factors that may have an effect on the operation of the system.

Specific operational scenarios are then described in users’ language to depict the full range of circumstances under which the system is required to operate.

It is not necessary to describe every possible scenario, but all types of operation must be represented. Scenarios also need to represent all stakeholder perspectives.
2.2 Select Operational Scenarios

- These scenarios, or use cases, provide valuable guidance to the system designers and form the basis of major events in the Acquisition Phase such as acceptance testing of the system as it is introduced into service.

- Despite any more detailed technical verification and validation procedures, the system’s fitness for purpose is fundamentally related to its ability to perform in accordance with the operational scenarios defined at this stage.

- In many cases it is also useful to define the various modes of operation for the system products under development. Designers need to understand if the system is to exist in a number of different modes even if it is as simple as the difference between the fully operational mode or the training mode.

2.2 Select Operational Scenarios

- Complex systems may have their requirements stated in a number of modes. For example, a modern fighter aircraft may have modes defined for air-to-air combat, ground attack, reconnaissance, naval operations, non-tactical flights, and so on. Each mode must be associated with the particular conditions (mission, operational, environmental, configurational, and so on) that define it.

- In our aircraft example, a number of modes may be defined for international and domestic operation including taxi, take-off, cruise, approach, landing, turn-around, and so on. Modes may also be defined for maintenance and for administrative movement of the aircraft.
2.2 Select Operational Scenarios

- Users tend to think in terms of the systems operation to suit their purposes—care has to be taken to define exception conditions.
  - For example, a pilot of a combat aircraft will naturally describe a number of modes and states during which adversary aircraft are engaged and destroyed, but will need some prompting to describe what happens when the pilot’s aircraft is hit and the pilot must eject.
  - At every stage in each scenario, we must ask the question “What could go wrong here?”

Define Capability System Constraints
Project and Enterprise Constraints

- Before focusing on the detail of the desired system, it is essential to identify the project and enterprise constraints that are relevant to the system and its acquisition. This analysis provides essential information about the development environment for the system and begins the top-down approach to system development.

- Enterprise constraints include any organizational policies, procedures, standards or guidelines that guide system development and procurement. These constraints can include partnering relationships with other companies, contracting policies and so on.

Project and Enterprise Constraints

- Project constraints include the resource allocations to the project as well as any externally imposed deliverables and acquisition timeframes.

- Many companies have enterprise-wide standards for processes such as quality assurance and systems engineering and these methodologies guide the manner in which projects can operate.

- Additionally, the enterprise may require the project to report progress in a particular way or to implement particular metrics, tools and documentation procedures.
Identify External Constraints

• In addition to enterprise-imposed constraints, there are wider external constraints on system development that arise from the requirement for conformance to national and international laws and regulations, compliance with industry-wide standards, as well as ethical and legal considerations.

• Other external constraints include the requirement for interoperability and the capabilities required for interfacing to other systems.

• Again, an important aspect of top-down design is to understand these constraints before considering lower-level system requirements.

Identify External Constraints

• External constraints could include:
  
  – Business environment. The system will no doubt be affected by changes in the broader business and economic environment, particularly those related to cost, pricing, availability, and licensing.
  
  – Conformance to laws and regulations. Conformance to laws is binding within a national or international legal construct; regulations are normally provided by governing bodies within the application domain of the development.
  
  – Compliance with standards. Industry standards provide similar constraints to laws and regulations, except that compliance with any particular standard may be at the discretion of the developer, unless the standard is mandated by the enterprise or by the contract.

  – …
Identify External Constraints

- External constraints could include:
  - ...  
  - **Ethical considerations and social responsibility.** System developers have a moral and ethical responsibility to the owners and users of the system, as well as to the community.  
  - **Interoperability and or interfacing requirements.** Since it is rare that a system would stand alone, interoperability and interface considerations must be taken into account during development.  
  - **Operating environment.** The system will have to exist within an operational environment that will provide constraints in terms of temperature, humidity, and radiation as well as robustness to shock.

Identify Design Constraints

- Design constraints include those factors that directly affect the way in which the system design can be conducted. Of course, a number of enterprise, project and external constraints (such as budgets, regulations, and standards) will flow down and be inherited as design constraints.  
- Typical design constraints include the state-of-the-art of relevant technologies, the skill sets of available engineers and tradespersons, as well as extant methodologies and tools to assist in the design, development, construction, and production of the system.  
- Additionally, bounds such as all-up weight may be a design constraint for an aircraft system if it is to land on certain classes of airfield.
A Cautionary Note WRT Constraints

• Having identified constraints, work should not progress until each constraint is tested and taken on knowingly into the next activity.

• That is, we must convince ourselves that each constraint is inviolate and is generally a constraint.

• It doesn’t necessarily follow that a current constraint will remain so, or should remain so without question.

• We should therefore consider what can be done to remove the constraint if that would facilitate the progress of the project.

A Cautionary Note WRT Constraints

• In many cases the constraint will be intransigent—for example, if a vehicle is to operate on public roads, it must conform to the appropriate regulations.

• In many other circumstances, however, the constraint may be able to be lifted, to the advantage of the project—for example, budgetary and schedule constraints may be eased with negotiation, or the restrictions imposed by a standard mandated by the enterprise may be able to be removed if it can be shown to be unnecessarily prescriptive.

• The cautionary note is therefore that a constraint isn’t so just because some stakeholder or regulator said it is, or because it always has been so in the past. If a constraint places some undesirable bound on the project, we should not just accept it without question but should investigate ways of removing the restriction if that is to our advantage.
Overview of CLC Artefact development

- Artefacts are developed over the CLC to perform a number of functions:
  - Recording evidence and decisions
  - Supports considered analysis and records rationale
  - Allows demonstration of traceability
  - Supporting Risk reduction
  - Establishes authority and certainty
  - Provides continuity of position, expectations, and agreed outcomes
  - Bounds the scope and enabling parameters
About the Capability Systems Centre

The Capability Systems Centre at UNSW Canberra is a centre of research excellence focused on disciplines related to the development, acquisition and sustainment of capability throughout the capability life cycle (CLC).

The principal focus of the Centre is to address shortfalls in research of methodologies, tools and techniques for developing capability. We do this through cutting-edge research and analysis, publications, education, and events; drawing on world-class academic expertise across our disciplinary areas.

The Centre is able to provide research, mentoring and assurance support to decision makers, systems engineers, business analysts, and project, program and portfolio managers in Defence, Government and Industry.

Our services include:

- **Independent Assurance**
  - Project and program reviews, technical and engineering risk assessments and business and innovation assessments.

- **Research & Independent Advice**
  - Mentoring, technical ‘deep dives’, investigations and research.

- **Education, Training & Events**
  - Postgraduate courses, professional education short courses and events.

Tailored Education and Training

The Centre offers organisations the flexibility to choose unique education and training solutions to fit organisational objectives:

- **Custom Programs**: Fully customised in-house development to align with your business education and training strategy.
- **Tailored on-campus programs**.

CLC/Capability Management Short Courses

The Capability Systems Centre offers the following CLC and capability management related professional education short courses.

- **Introduction the CLC and Capability Management**
  - 4-9 Feb 2018 (Canberra)

- **Systems Engineering Practice**
  - 19-23 Mar 2018 (Canberra)

- **Introduction to Capability Management**
  - 25-28 Mar 2018

- **JCNS and OCD Development**
  - 16-18 Apr 2018 (Canberra)

- **Requirements Writing**
  - 19-20 Apr 2018 (Canberra)

- **Systems Engineering Practice**
  - 7-11 May 2018 (Melbourne)

- **Introduction to Project Management**
  - 23-25 May (Canberra)

- **Introduction to Systems Engineering**
  - 28-30 May 2018 (Adelaide)

- **Introduction to the CLC and Capability Management**
  - 25-29 June 2018 (Canberra)

- **Systems Engineering Practice**
  - 27-31 Aug 2018 (Canberra)

- **Introduction to Capability Management**
  - 17-19 Sep 2018 (Canberra)

- **JCNS and OCD Development**
  - 8-10 Oct 2018 (Canberra)

- **Requirements Writing**
  - 11-12 Oct 2018 (Canberra)

Further Information

Further information on these courses or the Capability Systems Centre in general is available by contacting Centre staff at:

**Telephone**: 02 6268 8960 or 02 6268 9566

**Email**: capabilitysystems@adfa.edu.au

**Web**: capabilitysystems.unsw.adfa.edu.au