

Implementation of Asset Management in Defence

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Project Lead

Defence Aviation Asset Management Project

Defence Aviation Asset Management Project

- Initially tasked by Air Domain to develop and implement a system of Asset Management
- Project commenced in Feb18
- Partnership agreed between Air Domain and Program Management Function
- Intent to use Air Domain as a pilot site

Current DAAMP Status

- Initial “Asset Management System” developed based on ISO55000
 - Initial set of “Asset Management Practice Guides” developed
 - “Published for trial” as the (working title) “Defence Aviation Asset Management Manual”
- Evaluation currently underway at Cargo Helicopter & Unmanned Aerial Surveillance (CHU) and Airborne Early Warning & Control (AEWC) System Program Offices
- Seeking to develop IT support
- Developing the integration to ADF logistics policy through the CASG Business Framework (and particularly the Product Management Manual)

CASG Policy Statement

CASG Functional Policy (Program Management) 001 “Sustainment Management in Capability Acquisition and Sustainment Group”

CASG shall implement Sustainment Management in accordance with the principles of Asset Management as described in AS ISO 55000 - 55002:2014.

CASG shall tailor the way it implements sustainment management according to the complexity, importance and risk of the products and associated sustainment environment, as codified in the Materiel Sustainment Category.

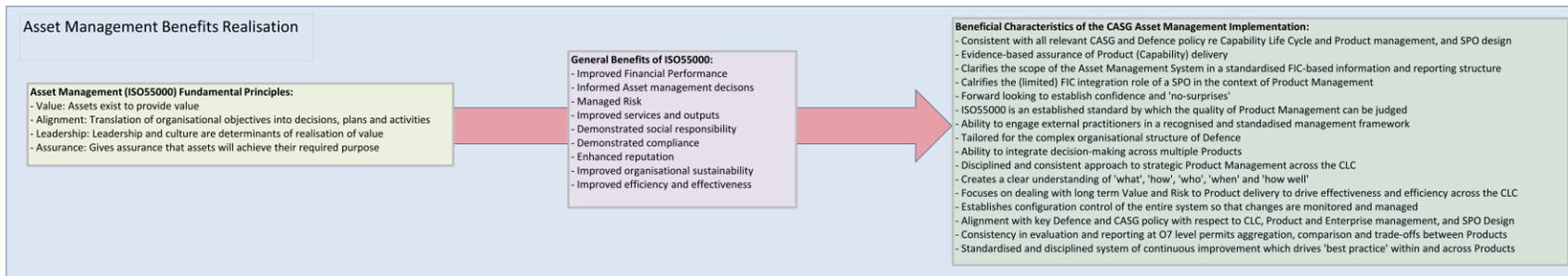
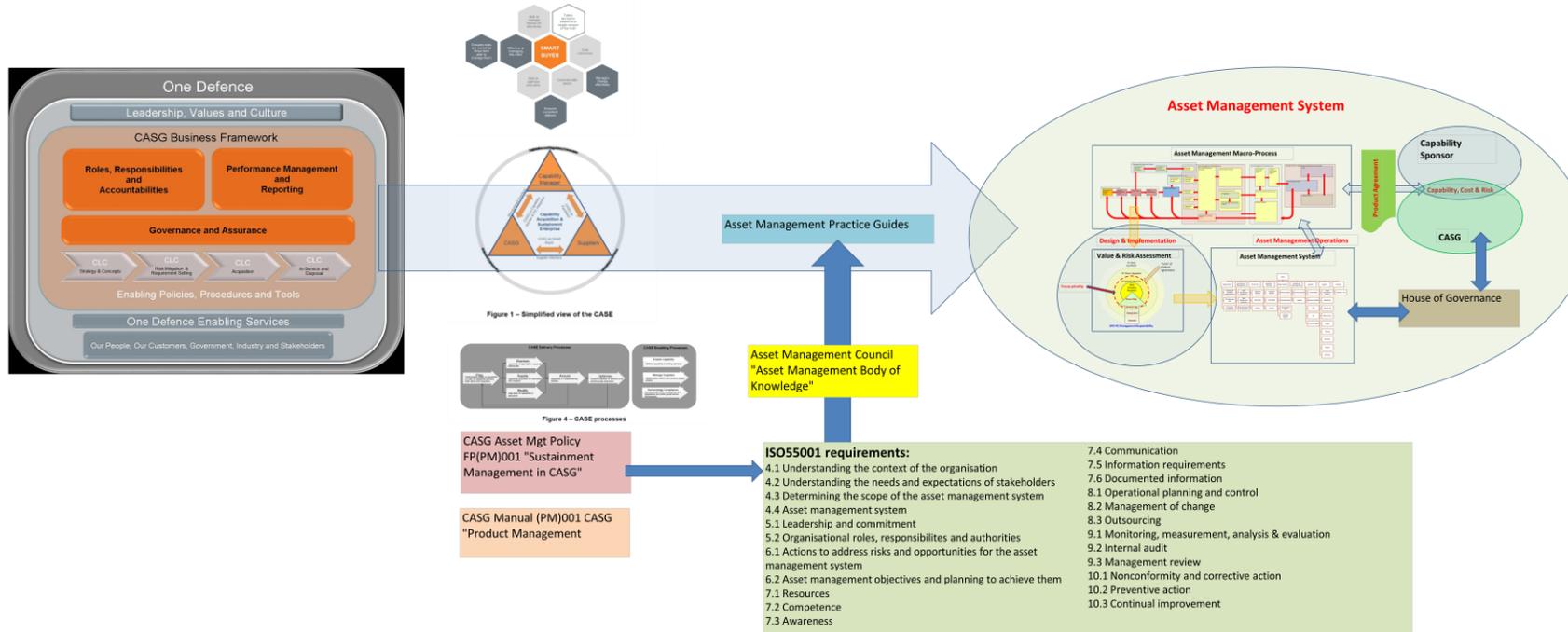
What is Asset Management?

- Application of Systems Engineering to management to the life cycle of an “Asset”
 - A **disciplined, evidence-based** system of management
 - Not dissimilar to ISO9001 but with a specific purpose in mind
- **An Asset is anything that delivers value**
 - In the Defence-CASG context, value derives from delivery of **Capability**
- Focus on whole-of-life of an “Asset”
 - Strategic, not tactical
 - Battle rhythm more in months to years rather than weekly
 - Long term strategic assessments

What's this got to do with Ageing Aircraft?

- Aircraft systems are a major Asset that:
 - Cost a fortune to buy
 - Cost a larger fortune to operate
 - Take a long time to replace
- We need a consistent and disciplined approach to ensuring and assuring that aircraft systems can meet their capability requirements across their life
- That means managing cost and risk while seeking to meet capability.
- Asset Management gives a consistent, evidence-based approach to managing any asset over the long term

Purpose: Assurance that the **Capability** required in a **Product Agreement** can be delivered across the **Capability Life Cycle** at the assigned **Cost** and accepted level of **Risk**

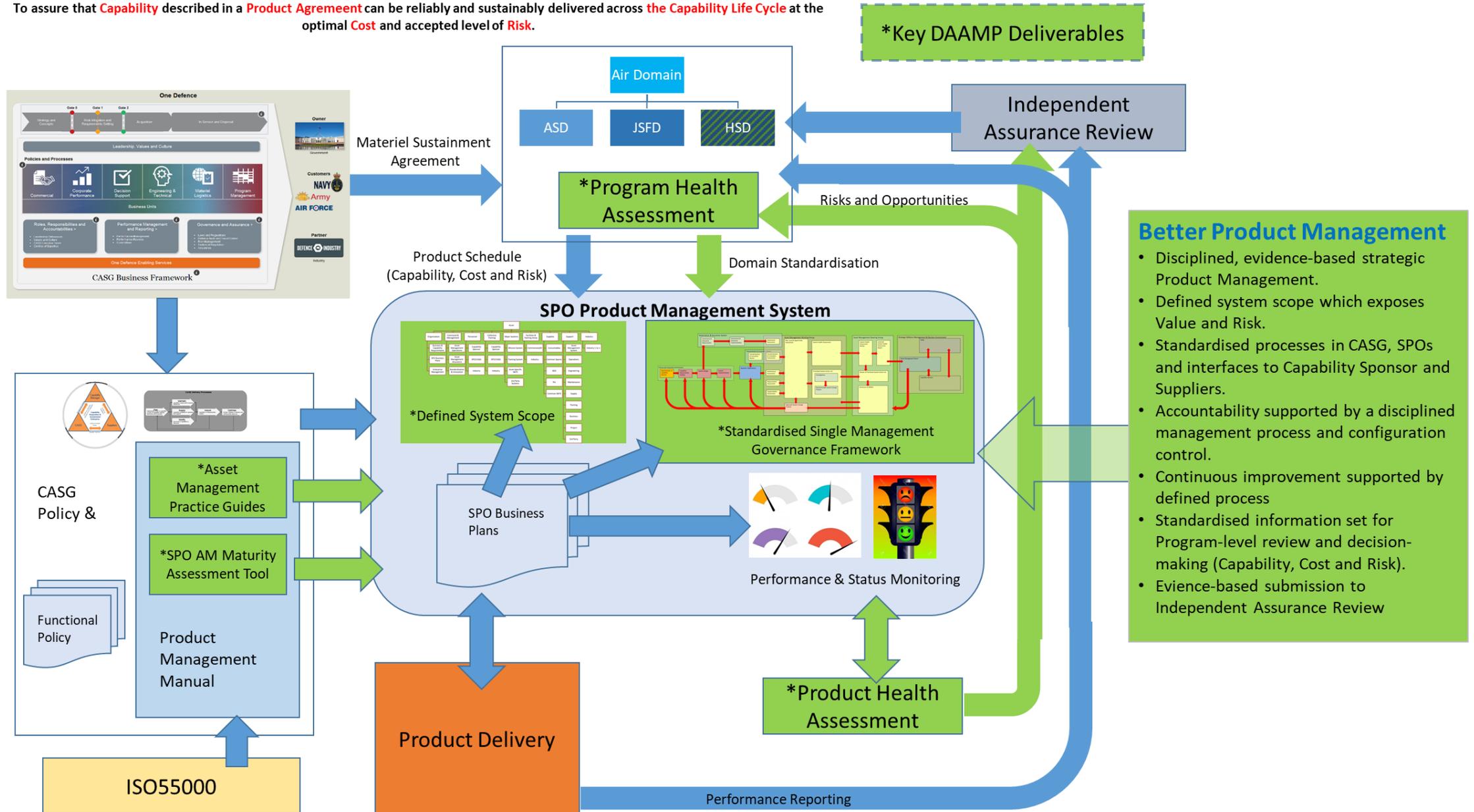


The *Product Management* Context

- Defence calls its in-service items “Products” for the purpose of assigning management responsibility
- Management responsibility is assigned by a “Capability Sponsor” (eg Chief of Air Force) to a “Delivery Group” (in our case the *Capability Acquisition & Sustainment Group* or *CASG* for short) via a *Product Delivery Agreement*
- The PDA usually identifies the major systems, rate of effort, assigned resources, management strategy and risk associated with each Product.
- CASG assigns responsibility for each product to a Domain and through the organisation to a Systems Program Office (SPO)

Defence Aviation Asset Management Project Contribution to Product Management

To assure that **Capability** described in a **Product Agreement** can be reliably and sustainably delivered across **the Capability Life Cycle** at the optimal **Cost** and accepted level of **Risk**.



The value statement for Asset Management

- Clear identification of system scope provides consistency over time
- Disciplined approach to system characterisation and change management ensures that changes are endorsed by management
- A holistic and strategic approach to Capability, Cost and Risk which focuses decision-making on benefits in the long term
- A defined system of continuous improvement which can be rolled out across Domains
- Standardised approach which provides for trade-off decisions for multiple systems

What is different?

- Current systems only partially meet the requirements of ISO55002
- Provides an explicit, disciplined, evidence-based response to the Asset Management proposition:
 - “Can the Capability described in a Product Delivery Agreement be reliably and sustainably delivered across the Capability Life Cycle at optimal Cost and accepted level of Risk?”
 - “If not, why not, and what do you recommend ?”
- **Precise scoping of the “Asset Management System”**
 - Current approach is focused on “functions”
 - Value and Risk based system of assessing system scope
 - Includes significant input elements
 - Consistent over time
- Capability focus
- Standardisation and innovation – an explicit system of continuous improvement

The Defence Asset Management Proposition

To assure that **Capability** described in a **Product Delivery Agreement** can be **reliably and sustainably** delivered across the **Capability Life Cycle** at the **optimal Cost** and **accepted level of Risk**.

- **Assure**: an explicit assurance statement is a key outcome
- **Capability described in a Product Delivery Agreement**: not just pieces of tin, but services and other requirements
- **Reliably and sustainably**: No surprises! (see Risk)
- **Capability Life Cycle**: This is a strategic (long term) focus
- **Optimal Cost**: Continuous improvement attuned to overall requirements
- **Accepted level of Risk**: No management system is perfect

Philosophy behind development of the Asset Management System

- “Asset Management” **equals** “Strategic Product Management”
- *Explicit assurance* of the Asset Management proposition
- *Capability* delivery focused on the Product Delivery Agreement
- Assurance of outputs requires *assurance of inputs*
- *Standardised CASG conformance with ISO55000* obtained by following the Asset Management Practice Guides
- *Value and Risk* based “expert judgement” management system
- *Disciplined, evidence-based and consistent* application (what, who, when and how)
- *Operationalising* Product Management (a “*how to*”, not just philosophy)
- *Tailorable* at SPO/Product level to meet Enterprise/Product needs
- *Standardised* information at O7 level for program management and strategic decision-making
- *Maps* to existing information, documentation, policy and practices where available to avoid duplication
- *Generic* approach to “Defence Major Systems”
- Focus on *In-Service & Disposal Phases* of the Capability Life Cycle
- Operates to a *strategic battle-rhythm*
- *Scaleable (big or small, Products or Programs)*
- *Commonwealth as the primary decision maker*

Asset Management Practice Guides

- A set of “Asset Management Practice Guides” has been ‘published’ in Objective
- Supplements the Product Management Manual
- Intent is that SPOs do not refer to the ISO standard but implement the standardised practices described in the AMPGs
- Written in ‘plain English’ so as not to constrain thinking
- Standardised at a level that can be tailored for the management context of each individual Product
- Intent is to place these into House of Governance to support initial SPO rollout
- DAAMP is seeking feedback on the content of AMPGs

Example AMPG

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ASSET MANAGEMENT PRACTICE GUIDE - ASSET MANAGEMENT MACRO PROCESS

PURPOSE

The purpose of this Asset Management Practice Guide is to describe the Asset Management Macro-Process and its battle-rhythm.

OVERVIEW

The Asset Management macro-process describes the over-arching conduct of Asset Management for an Asset from Acquisition, through the In-Service Phase, and into Disposal.

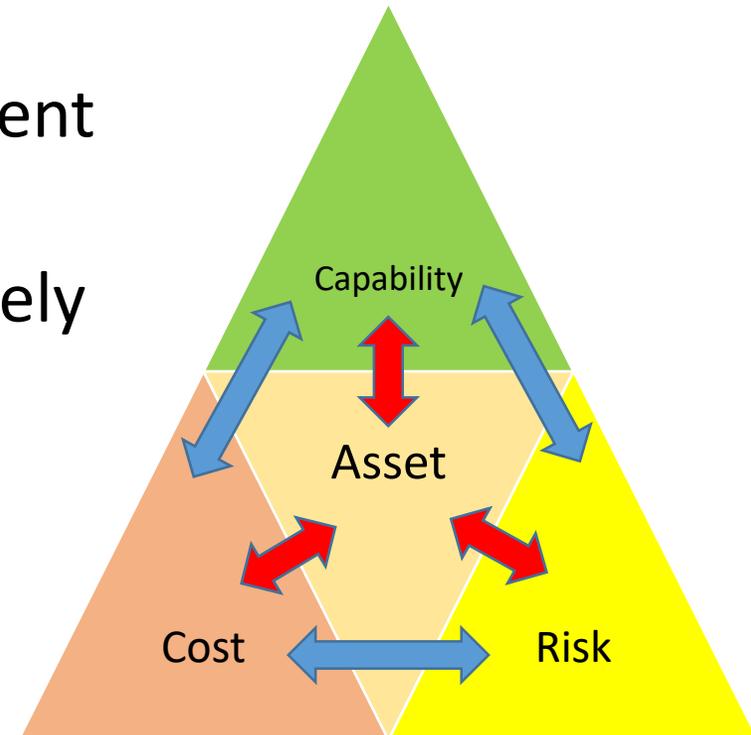
The generic Asset Management macro-process is shown in the process flowchart. Key characteristics of the macro process are:

- The generic process is essentially a disciplined application of systems engineering to identify requirements, implement a system, monitor the system, and manage changes. A key aspect

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A three-cornered optimisation problem

- Asset Management is about the *integration of and inter-relationships between Capability, Cost and Risk* to deliver across whole of life
- **Capability, Cost and Risk** define both the boundaries of the Asset and its management health
- The elements must be dealt with collectively because of their interactions.
- **Only the Capability Sponsor can ultimately accept trade-offs between Capability, Cost and Risk.**



The Commonwealth as decision-maker

- Only the Commonwealth can make the **decisions** to trade-off Capability, Cost and Risk at a macro level
 - This is the bailiwick of the Capability Sponsor, informed by CASG
- Our Industry Stewards have a prime role in operating the AM system and providing advice and recommendations
- Each SPO has a prime role of providing **assurance** of the Asset health and AM system operation

Capability

- Capability = Value (in our context)
- Can be lots of things:
 - 'pieces of tin' (ie materiel)
 - Services
 - Standards and regulatory compliance
 - Rate of effort
 - Reliability (availability)
- Subsets:
 - **Required** Capability – That which is specified in the Product Delivery Agreement
 - **Inherent** Capability – Internal characteristics of the Asset which also deliver Capability. Usually an interface to the external environment that is not mentioned in the PDA.
 - **Supporting** Capability – That which CASG creates to deliver the Required Capability.

Inherent Capability

- Not usually/always specified in the description of Major Systems in Product Delivery Agreements
- Usually involves something that interacts with the external environment:
 - Communications
 - Weapons
- Much of the materiel that delivers Inherent Capability does not last the entire life cycle (avionics, power plants, sensors, communications)
- Key point: The Capability Sponsor wants Capability, not the “as-delivered configuration”
 - Radios that work
 - Weapons that fire and then hit the target
- **CASG’s (Product Management) job is to assure ongoing *Capability* delivery**
 - That is why AM includes a system of in-service Verification & Validation

Cost

- “Cost” means all resources allocated to the deliver of the Asset
- Seeking to take a **whole-of-life** approach to **total cost**
 - Not just about ‘optimising’ subordinate parts
- Does not mean that the SPO needs to track all measures of cost
- But does mean that understanding cost and cost drivers is an important in decision making
- The optimisation problem for AM seeks to **minimise the cost** of capability delivery in the context of the risk appetite
- Continuous improvement (via the Innovation & Standardisation framework) is an important factor for dealing with cost

Risk

- AM does not establish an independent risk management framework
 - Commonwealth and Defence risk management frameworks apply
- AM does, however, seek to address a particular class of risk:
 - **Medium to long term impact to Capability delivery**
- “accepted level of Risk” means that there needs to be a holistic understanding of the established risk levels from a CLC capability delivery perspective
 - The overall risk levels include the implied level of risk required by regulatory frameworks (eg DASR)
 - The overall risk level should be communicated to the Capability Sponsor in the Product Delivery Agreement

Key Elements of the Asset Management System

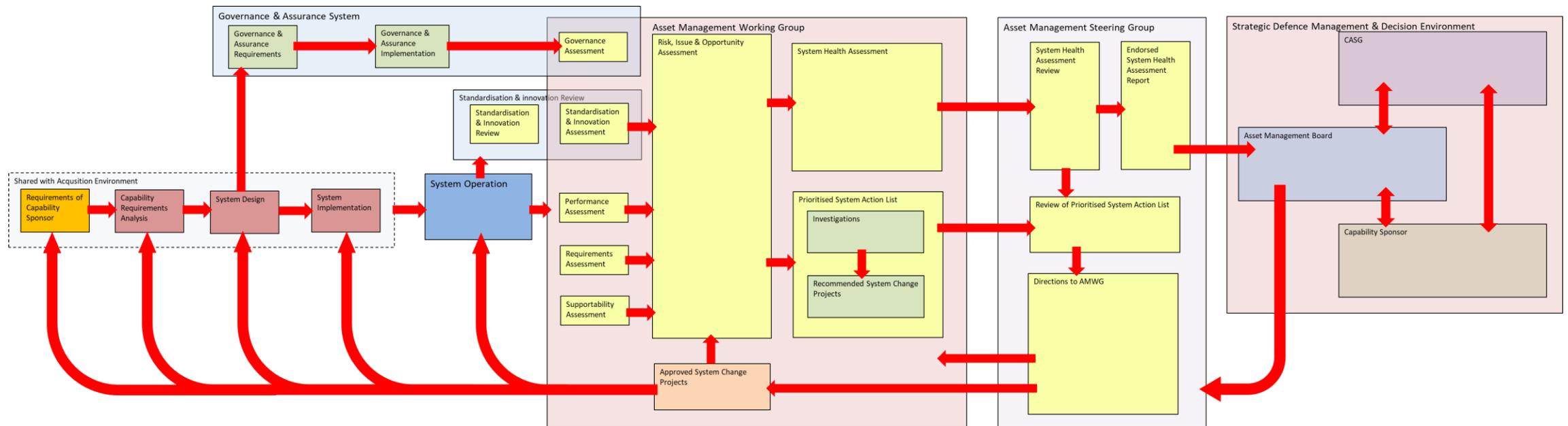
- Value/Risk-based approach (scope and decision-making)
- Asset Management Plans
- Asset Management Macro-Process
 - “How” Asset Management is conducted
- Asset Work Breakdown Structure
 - “What” we are managing
- Innovation and Standardisation
- Product (and Program) health reporting

Asset Management Plans

- Intent is that AM requirements would be mapped into SPO and Enterprise business plans
 - Meet the requirement, not obliged to create new plans
 - Requires mapping to trace requirements
- Four levels of plans and planning:
 - SPO Strategic Asset management Plan
 - Enterprise Strategic Asset Management Plan
 - Enterprise Asset Management Plan
 - Asset Element Strategy

Asset Management Macro-Process

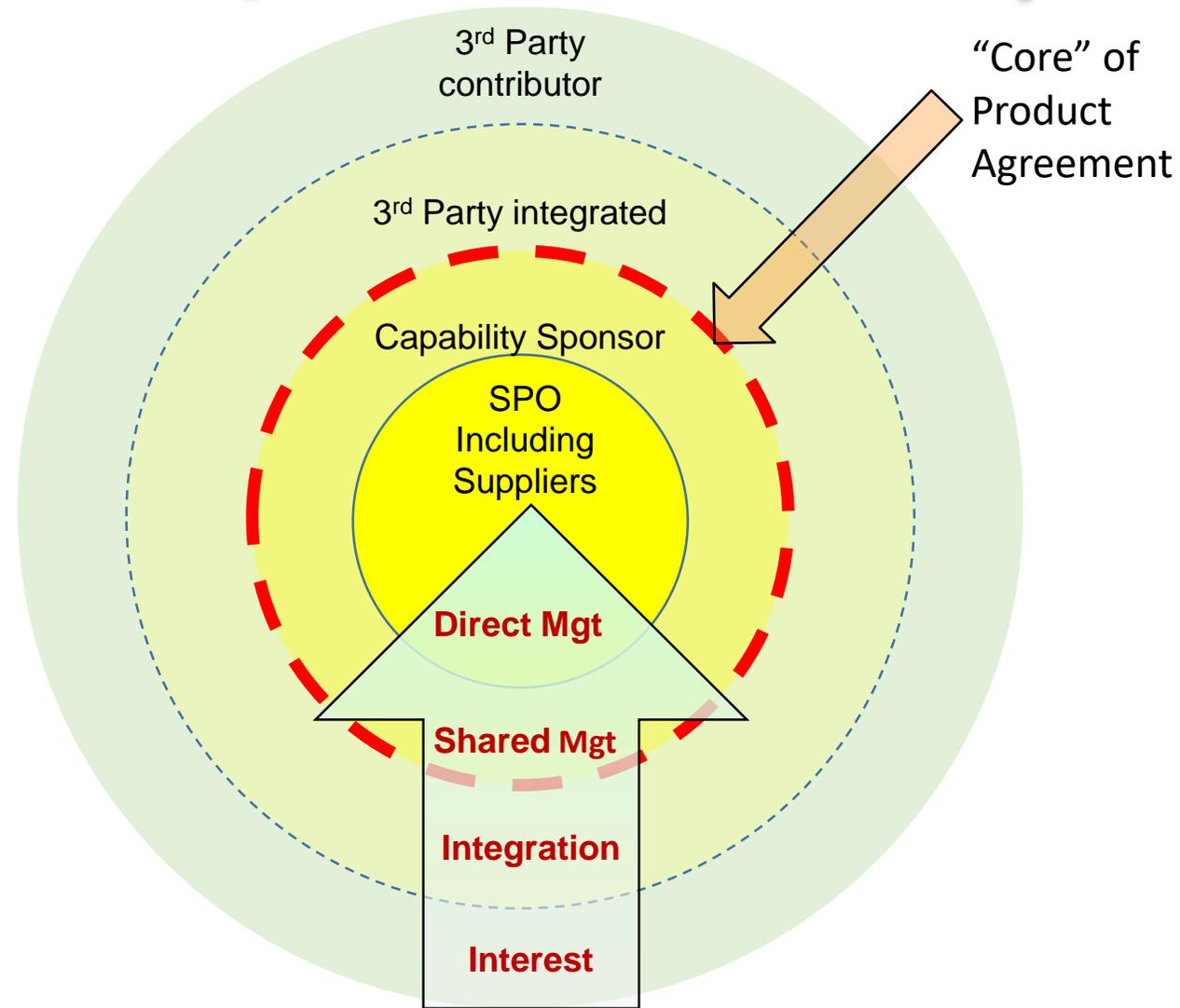
- Consistent with Single Management Framework evident in most SPOs
- Battle rhythm conducted on strategic timescales



The Work Breakdown Structure - Scoping the Asset Management System

- A specific requirement of ISO55002
- Ensures a consistent and controlled definition of the scope of the system
- Standardised reporting to higher management levels
- Value/Risk based assessment
- Role of the SPO as a “FIC integrator”
 - Not just about those Asset-elements that are in the direct control of the SPO
 - ... and some of these FIC contributions come from the Capability Sponsor

Asset / Product Boundary



SPO FIC Management Responsibility

FIC Integration

- SPOs have a defined role of “FIC integration”
 - Refer to the SPO Design Guide
 - In the context of AM, much of this role is assigned to the Steward (preferably Industry)
- The level of FIC integration specified in the AM system is constrained to that necessary to deliver a Product
- An obligation for FIC integration does not imply that the SPO becomes the actual ‘item manager’
 - The obligation is limited to that required to deliver the Product
 - The Asset (Product) includes third-party managed items eg weapons, radios

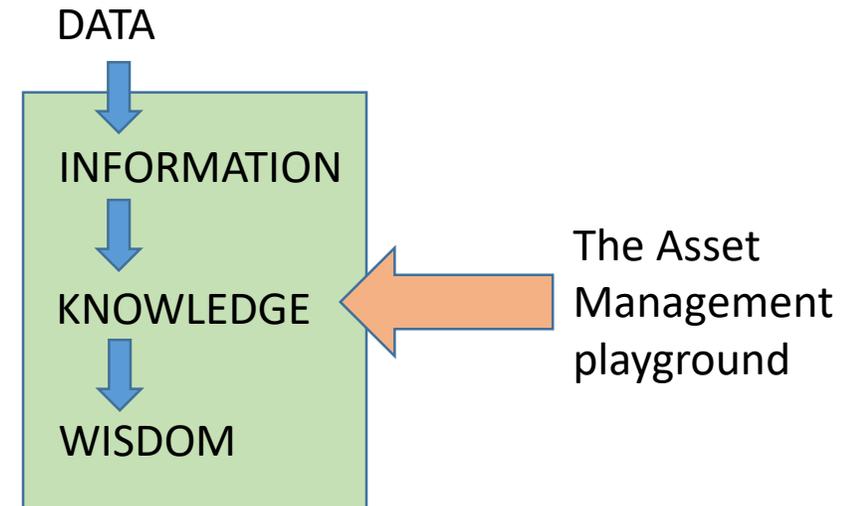
The Process of Asset Identification and Characterisation

- Desire to identify all entities which deliver *significant* Value or Risk to Product delivery
 - The word “*significant*” implies that a judgement has to be made
 - “*to Product delivery*” means that we are not trying to manage the value and risk propositions of other organisations – it is *our value and our risk* associated with Product management that we seek to manage
- Based on Fundamental Inputs to Capability (FIC) – key function in Product management is FIC integration
- Intent is to break the Asset (Product) into all of its component parts to a level that makes management sense

Information Requirements

- Description of the entity
- Value
 - What is the capability requirement?
- Risk:
 - What are the key risks associated with each entity?
 - Have the risks emerged?
- Strategy
 - How do we deliver the value and manage the risks?
 - How are we governing and assuring?
- Performance
 - What are the performance requirements?
 - How is the item performing?
- Life
 - What is the life of the entity?
 - What is the life consumption?
- Cost
- Supportability

- It is all about KNOWLEDGE and WISDOM
- Data-driven where possible, but not buried in raw data



Asset Health Assessment

- Level of confidence in the ability to deliver Capability across the CLC
- Underlying questions:
 - Can we continue to deliver the required Capability across the CLC at the assigned Cost and accepted level of Risk?
 - If not, why not, and what should we do about it?
- Strategic (systemic) assessment:
 - Medium to long term impact only (not about daily serviceability)
 - No issues 
 - There are issues, but time to resolve 
 - There are issues, and insufficient time to resolve 

Asset Health Assessment

- You can't measure Asset health!
- This is not a 'formula-based', or 'instrumented' system
- While supported by measurements and information, the assessment of Asset health is ultimately one of **expert judgement primarily based on risk assessment**
- **Data and information can inform but cannot determine the outcome**
- **Predictions of the future are unreliable and therefore need to be repeated periodically to maintain confidence**

The Five Subordinate Health Assessments

- **Governance:**
 - Are the governance requirements being applied?
 - Has any deficiencies been identified?
- **Standardisation & Innovation:**
 - Can we make improvements?
- **Performance:**
 - Are measured performance trends appropriate?
- **Requirements:**
 - Have requirements changed (implicitly or explicitly) ?
- **Supportability:**
 - Are we confident of future availability of inputs?

Change Management

- **Macro system change management** – this isn't about the changes to materiel components
- However – the same level of **discipline** is applied to AM system changes as it is for components
 - Requirements
 - Outcomes
 - Strategy
 - Major configuration changes
 - Risk profile
 - Cost

Operational Verification & Validation

- In case of boredom, Google “Mark 14 torpedo”
- Not all Capability can be assured from the sedentary offices of CASG and our suppliers – there are some things that need to be operationally tested
- Operational testing is the responsibility of the Capability Sponsor
- CASG responsibility to **advise the Capability Sponsor** of the need for testing
 - Hence: an “Operational V&V Plan” to identify the requirements for testing
 - CASG obligation to provide engineering and other support to V&V

OV&V requirements (some examples)

- FIC integration:
 - Changes to ammunition batches can cause weapons to malfunction and/or cause adverse deterioration of a gun system (both outcomes are an AM problem)
- Configuration changes:
 - Software changes can result in failure of hardware to operate correctly
- Storage & maintenance conditions:
 - Unidentified deterioration in storage of explosives
 - “On Condition” shouldn’t mean “On failure” (that’s a surprise that we seek to avoid)
- Standards & regulations:
 - New or incompatible communications standards can result in comms systems that will not actually talk to each other

Initial SPO Roll-out Approach

- Self-prioritising system of management
 - Initial roll-out establishes and manages the scope and priorities for further roll-out
- Phased approach
 - Initial Operational Capability (IOC)
 - Basic elements are established
 - Initial assessment of scope, status, priorities and risk/issues
 - Maturation
 - As required in the context of the SPO and the assessed level of risk

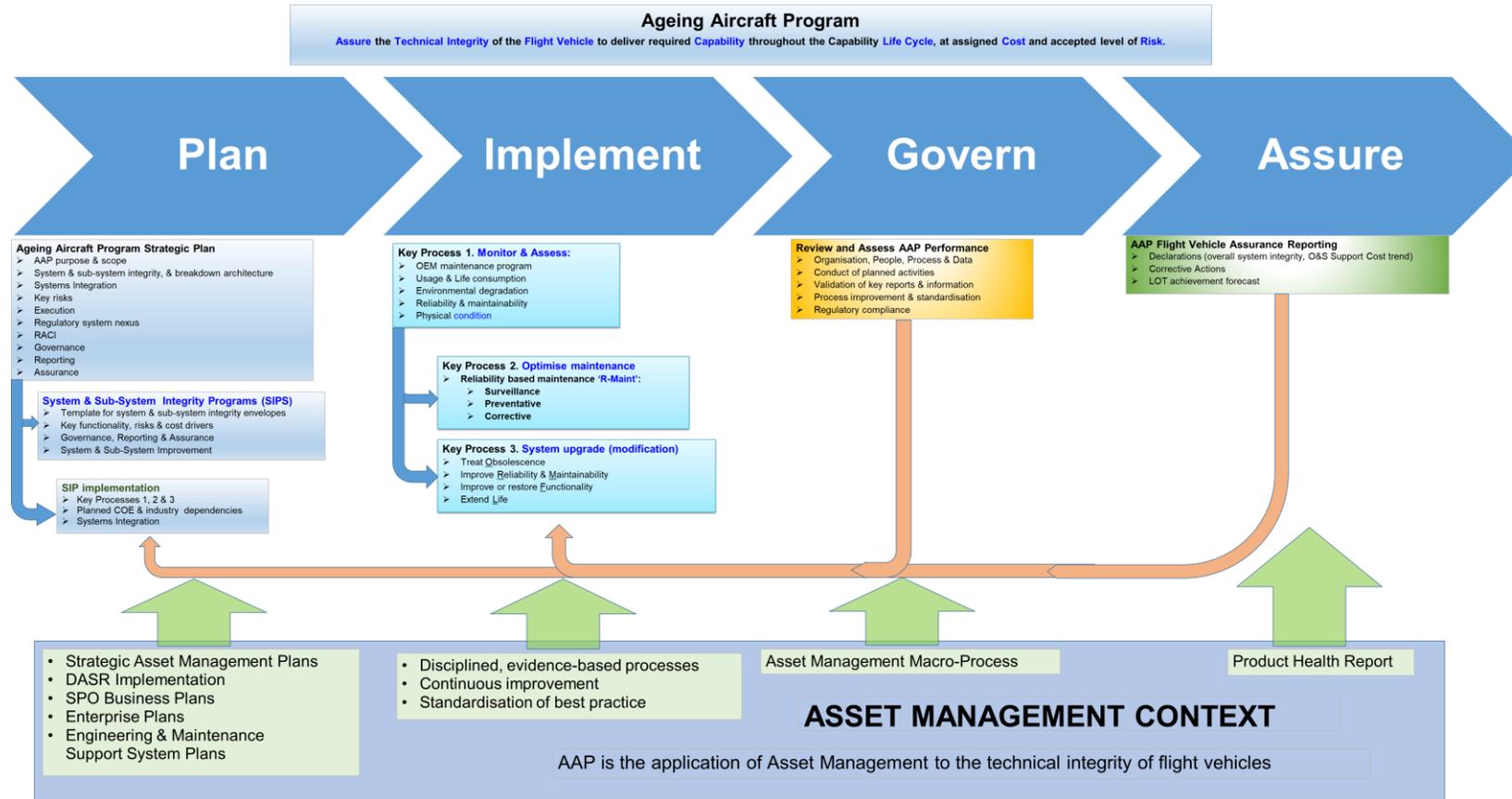
Asset Management Initial Operating Capability (IOC)

- Asset Management Macro-Process (ie Single Management Framework) is functioning
 - Forum membership established
 - Macro-process Battle Rhythm established
 - Oversighting system design and development
 - Conducting SPO maturity assessment
 - Developing, prioritising and implementing tasks for system maturation
 - Conducting Product Management health assessments (may be subjective)
- Via the Product Management health assessment, a task list has been established for maturation of the system
- SPO and Enterprise Strategic Asset Management Plans are in place and are subject to a process of regular review.
- Product (Asset) WBS has been documented:
 - Elements identified:
 - for which the SPO has a direct management responsibility
 - which are high value/risk and directly integrate with items for which the SPO has a direct responsibility
 - Key management information recorded against each Product WBS element:
 - Element name
 - Assigned management responsibility for that element

Further Development

- Integration of Asset Management requirements into CASG and ADF policy
 - Primary portal is the Product Management Manual via CASG Program Management Function
 - The Asset management Practice Guides are intended as a supplement to the Product Management Manual
 - Further developments into ADF Logistics policy – roles of CASG Materiel Logistics Function and Program Management Function
- Specific applications – Ageing Aircraft Program AMPG in development
- Development of supporting IT:
 - House of Governance as reporting portal
 - Database structure for information, knowledge, and decision-support
- SPO and Domain design – meeting a new set of requirements

Ageing Aircraft Program



Community of Practice Meeting 24-26Sep19

- Location: RAAF Williamtown (BAES facilities)
- Agenda:
 - Day 1: Review of the AM system
 - Day 2: Implementation
 - Day 3: Integration with CASG policy and practice
- Who:
 - Max 30 personnel
 - Defence and Industry (SPOs, Air Domain Centre, PM Function, Industry)
- Nominations to: GPCAPT Bernard Grealy bernard.grealy@defence.gov.au