Australian Government
Department of Defence
Defence Materiel Organisation

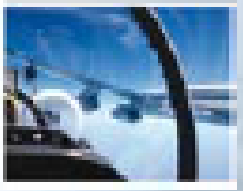
DEFENCE MATERIEL ORGANISATION

AEROSPACE SYSTEMS DIVISION

PERFORMANCE BASED CONTRACTING HANDBOOK

GUIDING PRINCIPLES AND PERFORMANCE FRAMEWORK



VERSION 2.0

ASD Performance Based Contracting Handbook

Version 1 – September 2005

Version 2 – February 2007

Sponsor

Head of Aerospace Systems Division

Developer

Performance Based Contracting Cell
Commercial Services Directorate
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Aerospace Systems Division

FOREWORD

When Version 1 of the Aerospace System Divisions (ASD) Performance Based Contracting Handbook was released in September 2005, it outlined the ASD vision for moving to Performance Based Contracting and I commended the Handbook to our Industry partners, highlighting that familiarity with the PBC Framework will assist you in doing business with the Division. This vision has not changed. The Division remains committed to providing an objective framework that directly links reward to the level of performance based on monitoring of delivered outcomes rather than the work undertaken, thereby encouraging the innovation and productivity improvements that are expected under longer-term contracts.

Version 2 of the handbook further emphasises the structured approach to the development and application of a PBC Framework within the Australian Defence Aerospace Sector. Specifically, Version 2 has been modified to include a General Process for developing a PBC Framework. The rest of the handbook is devoted to taking this General Process and applying it to four specific contract types; (1) Through Life Support (TLS) Contract, (2) Contracted Maintenance (CM) Support Contracts, (3) Repairable Item (RI) Support Contracts and (4) Aero Engine Support Contracts.

The following key principles continue to be applied in all Aerospace Systems Division contractual considerations:

- The achievement of Value for Money contractual outcomes for the Commonwealth is essential.
- The Key Performance Metrics used to measure contracted outcomes should be simple, measurable and meaningful.
- In return for longer term contracts there is an expectation of continued performance improvement and/or reduced cost of ownership over the life of the contract.
- The overall profit rate applied to the contract pricing should relate to the level of risk involved, and the at-risk margin is enduring for the life of the contract.
- The level of profit awarded should be linked to an agreed level of performance. The level of contractor exposure should be sufficient to incentivise performance to the agreed level.
- The Commonwealth will retain the right to terminate in whole or part for consistent under performance.
- The handbook has been exposed to a number of our industry partners via the Aerospace System Division PBC Industry Forum and Aero Engine Industry Panel. The Forum and Panel are arrangements between the Division, Australian Aerospace, Boeing Australia Limited, BAE Systems (Australia), Raytheon (Australia) and more recently QANTAS, Smiths Aerospace, General Electric and Rolls Royce. While the Forum and Panel has proved very useful in the open exchange of ideas I welcome further discussion and debate regarding the new models. The point of contact regarding this handbook is the ASD PBC Cell on (02) 6265 5418.

I encourage you to become familiar with the PBC Framework as it will be the standard methodology within the Division for key contracting sustainment activities. This handbook remains a cornerstone of that approach.

C. Rossiter AM
Air Vice-Marshal
Head Aerospace Systems Division
February 2007

PREFACE TO VERSION 2

The release of Version 2 of the Aerospace Systems Divisions (ASD) Performance Based Contracting (PBC) is the result of a number of changes from Version 1. The main changes are as follows:

- Creation of a part describing a General Process used to understand the PBC Framework used in the development and review of any Performance Based Contract.
- Tailoring of the General Process to provide coverage of the following four specific contract scopes.
  - Through Life Support (TLS) contracts
  - Contracted Maintenance (CM) Support contracts
  - Repairable Item (RI) Support contracts
  - Aero Engines Support contracts
- Removal of the charter and terms of reference for the Reliability Review Board (RRB) and procedure for Failure Definition and Scoring from the ASD PBC Handbook (previously Chapter 2 in the Supporting Documents part).

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PART 1 - INTRODUCTION

CHAPTER 1 - INTRODUCTION

Recommendation 4 of the Australian Defence Aerospace Sector Plan (2003) states that *'Defence actively pursue an Outcomes-based approach to contracting and contract management'*.

PURPOSE

This handbook has been developed to provide guidance to ASD Business Units for establishing an Outcomes or **Performance Based Contracting framework** when contracting with Industry for **sustainment** of their assigned Weapon Systems.

BACKGROUND

- The DMO Reform Program has initiated a shift in Defence contracts from the legacy prescriptive and process-driven model.
- The new model introduces a Performance Based approach to contracting to improve the effectiveness of Defence contracts.

Performance Based Contracting is defined as a product support strategy utilised by Program Managers (PM) to achieve measurable war-fighter selected performance Outcomes for a weapon system or subsystem. PBC utilises performance Outcomes such as availability, reliability, maintainability, supportability and total ownership cost. The primary means used to accomplish this end are incentivised, long-term performance based contracts with specific and quantifiable levels of operational performance as defined by the user. A Business Case Analysis (BCA) justifies the PMs decision to enter PBC contracts and includes thorough life-cycle cost and risk assessments of the expected operational performance targets selected[1]

[1] Modified from a definition of Performance Based Logistics from Performance Based Logistics Partnerships: Assessment of Implementation Methodologies for Selected ACAT 1 & 2 Systems AFLMA (Air Force Logistics Management Agency) Report (LM200400700) CAPT Kirk Pettingill and MAJ Michael A Knipper, October 2004.

- By contracting for Outcomes, ASD Business Units can better assure Capability Managers of the performance (Preparedness and Sustainability) of their Weapon Systems.
- A Performance Based Contracting focus recognises the strategic importance of a viable and enduring Industry sector.
- In turn, ASD is pursuing a total contractor support business model and contract terms are expected to be long-term or life-of-type.
- To assist ASD Business Units in their contracting out of endorsed sustainment functions in the new environment, HASD has sponsored the development of a Performance Based Contracting framework for Through Life Support (TLS), Contracted Maintenance (CM) Support, Repairable Item (RI) Support and Aero Engine Support contracts to be used in conjunction with the DMO endorsed contracting template.

PERFORMANCE BASED CONTRACTING FRAMEWORK

The key objectives of the ASD Performance Based Contracting framework are to:

- **transform our approach** in contracting from process/outputs/activities to one that focuses on **Outcomes** and **performance**,
- develop a culture of **greater cooperation** and **goal convergence** between Defence and Industry by aligning contract rewards to Capability Outcomes, and
- drive 'Best Practice' by encouraging **cost-effective** and **sustainable** support solutions.

STRUCTURE OF THE HANDBOOK

The Handbook begins with a Section on Getting Started which establishes the Business Case for PBC and the influences on the performance baseline. The remainder of the Handbook is structured around the critical elements of a Performance Based contract for five distinct contract types:

- Through Life Support (TLS) contract (PART 2),
- Contracted Maintenance (CM) Support contracts (PART 3),
- Repairable Item (RI) Support contracts (PART 4),
- Aero Engine Support contracts (PART 5), and
- Engineering Services Support contracts (PART 6) (TO BE ISSUED).

The scope of each contract is shown in Figure 1-1-1. Additionally, supporting documents necessary for the implementation of a PBC are attached at PART 7.

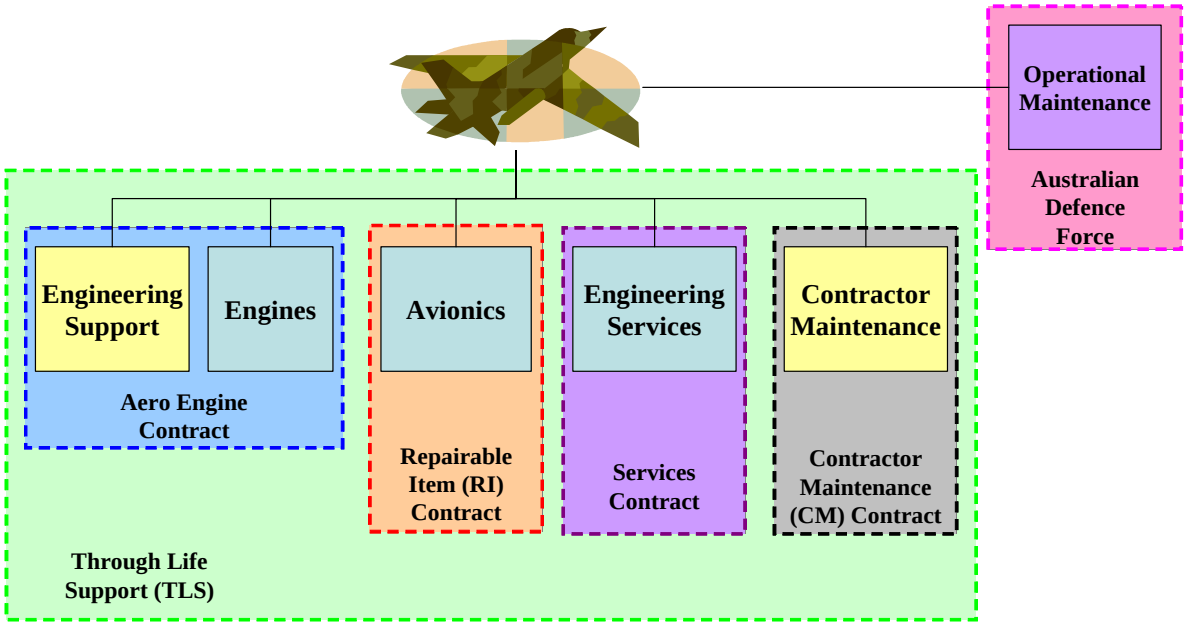


Figure 1-1-1: Scope of Various Contracts

Central to each Performance Based Contracting framework are the following six steps:

STEP 1 - Specify the Outcome (PART 1, CHAPTER 4)

STEP 2 - Select the Performance Measure (PART 1, CHAPTER 5)

STEP 3 - Set the Contracted Level (PART 1, CHAPTER 6)

STEP 4 - Define the Payment Regime (PART 1, CHAPTER 7)

STEP 5 - Define the Incentive Regime (PART 1, CHAPTER 8)

STEP 6 - Insert PBC Framework into Contract Construct (PART 1, CHAPTER 9)

These six steps represent the four key elements of any Performance Based Contracting framework, and form the basis for payment for achieved contracted levels of support. The four key elements are shown as the central bar on the performance framework schematic at Figure 1-1-2.

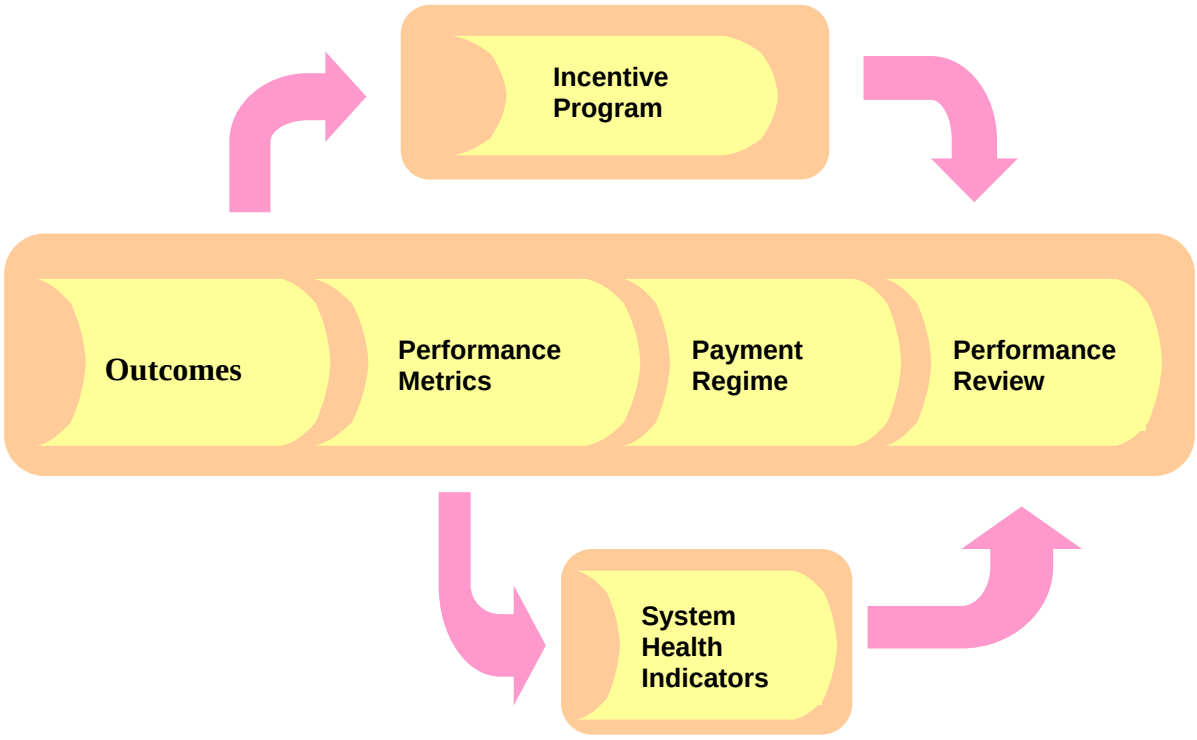


Figure 1-1-2: Performance Framework Schematic

Two additional elements of the performance framework are the System Health Indicators (SHIs) and the Incentive Regime. The SHIs are included in the discussion on Performance Metrics, as they are intrinsically linked to the Performance Metrics, and are essential for monitoring future support. However, they are not used to determine payment, and are shown on the performance framework as a supporting element. Finally, while outside of the contracted levels of services, there may be desired Outcomes and/or contractor behaviour at both the strategic and business levels that are best supported by an Incentive Program.

HOW TO USE THE HANDBOOK

The Handbook provides a general process, including guiding principles, that can apply to any contracting situation for developing a PBC Framework. Further Parts within the Handbook provide solutions to a specific contract scope using the general PBC Framework provided in Part 1. These solutions have been developed to ensure standardisation and reduce re-work, and are mandatory unless a Business Case can show that they do not suit the specific contract type in question (refer to Part 1, Chapter 2). The further parts within this Handbook apply the guiding principles to the specific Through Life Support (TLS), Contracted Maintenance (CM), Repairable Item (RI) and Aero Engine contracts scenarios to produce a mandatory set of procedures for all ASD support contracts.

Anything that is mandated for ASD Business Units is summarised in a shadow box at the beginning of each Chapter to ensure that it is clearly identified.

CHAPTER 2 - GETTING STARTED

BUSINESS CASE ANALYSIS

Aerospace Systems Division is expected to adopt a Performance Based Contracting (PBC) approach in all sustainment contracts unless a Business Case Analysis effectively argues that it would not represent Value for Money.

Business Case arguments that may negate a need to pursue PBC arrangements may include:

- that it would be prohibitively expensive;
- that it would not be cost-effective given the contract term or Planned Withdrawal Date (PWD) of the Weapon System; and/or
- that due to the developmental nature of the project, a performance baseline could not be established prior to contract signature.

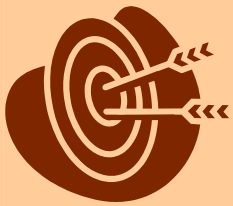
However, the scope of the contract, for example in being limited to the support of a single Repairable Item, is not expected to be an argument against PBC.

ADVANTAGES IN NEGOTIATING A PBC CONTRACT

Where a Business Case supports it, the following are some of the benefits of a PBC framework:

- It allows Defence Industry to be a true partner in the delivery of Capability Outcomes.
- It rewards the contractor fairly for achieved performance and is therefore a measure of the value for money of the contract.
- It can be less contentious than relying on contractual remedies for underperformance such as Liquidated Damages.
- It can provide valuable evidence in decisions relating to contract extensions and additional work.
- It can be beneficial to the contractor in their future dealings with the Division as '*past performance of contractual obligations of the tenderer*' can be used as a discriminating factor in tender evaluation.

CHAPTER 3 - GENERAL PROCESS FOR DEVELOPING A PBC FRAMEWORK



GENERAL 6 STEP PROCESS FOR DEVELOPING A PBC FRAMEWORK

Step 1 – Specify the Outcome

Step 2 – Select the Performance Measure

Step 3 – Set the Contracted Level

Step 4 – Define the Payment Regime

Step 5 – Define the Incentive Regime

Step 6 – Insert PBC Framework into Contract Construct

INTRODUCTION

This Chapter is intended to provide an insight into the general process for developing and implementing a Performance Based Contract (PBC) Framework.

While the six-step process is designed to allow ASD Business Units to follow a structured approached for the development and implementation of a PBC Framework, Parts 2 through 6 of this Handbook provide specific solutions to standardise the solution to specific contract types (e.g. Through Life Support (TLS)) and eliminate duplication of effort.

6 STEP PROCESS FOR DEVELOPING A PBC FRAMEWORK

As mentioned in Part 1 Chapter 1, the development and implementation of a PBC Framework can be achieved through the application of the following structured approach:

STEP 1 - Specify the Outcome (PART 1, CHAPTER 4)

STEP 2 - Select the Performance Measure (PART 1, CHAPTER 5)

STEP 3 - Set the Contracted Level (PART 1, CHAPTER 6)

STEP 4 - Define the Payment Regime (PART 1, CHAPTER 7)

STEP 5 - Define the Incentive Regime (PART 1, CHAPTER 8)

STEP 6 - Insert PBC Framework into Contract Construct (PART 1, CHAPTER 9)

CHAPTER 4 - STEP 1 – SPECIFY THE OUTCOME

GUIDING PRINCIPLES

The following are guiding principles in the specification of outcomes for a Performance Based Contract (PBC):

- A key aspect to ensuring that any contract can operate successfully is to have **clearly defined and measurable Outcomes** that both the contractor and the Commonwealth are committed to achieving.
- Traditionally, the focus in ASD Weapon System Support Statements of Work was on delivering services, rather than meeting capability performance requirements. New ASD support contracts must be developed from an Outcomes or Performance based approach – 'what must be delivered' – rather than a focus on 'how it is delivered'.
- Outcomes must be traceable to strategic guidance for new acquisitions, while they need to be traceable to existing contract outcomes for existing (legacy) contracts. Outcomes should be mapped from the Operational Concept Document and other strategic documentation pertinent to the Weapon System. Inherent to these requirements is the need to assure Capability Managers of the Preparedness of their capability.

Outcomes are Defence's key success factors in the support of a Weapon System. Accordingly, Defence is responsible for identifying Outcomes and determining how the contractor's performance contributes or detracts for the achievement of these Outcomes.

SAFETY

While the focus of the ASD PBC Handbook is primarily on performance management, it does not reduce or negate the responsibility of the contractor to produce and maintain materiel to a specified level of safety as either as an Authorised Engineering Organisation (AEO) or as an Authorised Maintenance Organisation (AMO).

- For Technical Equipment, performance is conceptually derived from the achievement of Readiness and Sustainability[2] . Readiness is synonymous with Availability of a system for use, while Sustainability covers Reliability, Maintainability and Supportability. Accordingly, an Outcomes-based approach will contribute to Preparedness by specifying Performance Metrics for the Weapon System characteristics of Availability[3], Reliability, Maintainability and Supportability.

[2] Sustainability is discussed later in the Handbook in the section on System Health Indicators.

[3] Availability is a derived characteristic that is dependent on a system's Reliability, Maintainability and Supportability characteristics. Some combinations of Weapon System characteristics will be less desirable than others. For example, availability may be attained through significant, lengthy and resource-intensive operational maintenance tasks or conversely, highly reliable but prohibitively expensive designs; or the frequency/duration of deeper maintenance servicing may compromise operational use or safety. The combination of Weapon System characteristics that optimises Defence's strategic Outcomes should be the basis for any ASD TLS contract

CHAPTER 5 - STEP 2 – SELECT THE PERFORMANCE MEASURE

GUIDING PRINCIPLES

The following are guiding principles in the selection of the specific Performance Measures to support a Performance Based Contracting (PBC) Framework for each outcome defined in Step 1:

- Performance Metrics are chosen that **best** represent their respective Outcomes, acknowledging that a single metric may be imperfect in fully representing the whole Outcome.
- For selection of best metrics, it must be understood that the mandated Outcome could involve activities/performance from both the Commonwealth and the contractor. For example, Systems Readiness will be influenced by Defence's provision of Operational Maintenance, responsiveness to engineering decisions and, where relevant, supply chain responsibilities. Similarly, "reverse logistics" or the rate at which the Commonwealth inducts Repairable Items may also affect Assurance of Supply. As such, when contractor performance is being assessed for payment purposes, these Defence processes must be excluded from the calculation.
- Performance Metrics are **lag** indicators and represent the contractor's performance in the last reporting period. contractors are paid on their performance, and therefore their achievement against the Performance Metrics (Refer to Part 1, Chapter 7).
- The Australian Defence Aerospace Sector Strategic Plan describes the trend towards a 'whole of life approach to acquisition and through life support'. Performance Metrics can therefore be chosen for systems performance characteristics that were specified during the "Requirements phase"[4], responded to in the tender and contracted in the "Acquisition phase"[5]. In this manner, Performance Metrics can be used to demonstrate user requirements, and supplement Test and Evaluation, Warranty and Latent Defect provisions.

CHOOSING A PERFORMANCE METRIC

The first step in choosing a performance metric is the collection of a number of Performance Metrics, typically through a facilitated 'brainstorming' workshop. This workshop requires attendance from personnel with a wide range of backgrounds including the ASD Business Unit, operational units and their superior commands (i.e. Force Element Group (FEG)).

[4] refers to the written specification of the "need" in Defence document such as Operational Concept Documents (OCDs) and Function and Performance Specifications (FPSs)

[5] refers to the Tendering and Contract documents such as the Request For Tender (RFT) including the Statement of Work (SOW) and Function and Performance Specifications (FPS)

Once the Performance Metrics have been identified it is then necessary to select, and separate, the primary, payment related Performance Metrics from the secondary System Health Indicators using the methodology below.

TIERS OF PERFORMANCE MEASURES

In establishing and operating a successful Performance Based Contract, two tiers of performance measures are to be used – **Tier 1** Performance Metrics and **Tier 2** System Health Indicators.

- **Tier 1 - Performance Metrics** are Outcome based metrics and are, therefore, measures of the effectiveness of the Weapon System. These metrics are **lag** indicators of past performance and are used principally to ensure the contractor remains focussed on the Outcomes required by Defence and is only paid for their actual performance against these Outcomes.
- **Tier 2 – System Health Indicators (SHIs)** are largely contractor and customer negotiated and relate to critical processes or activities that give an indication of the system health of the support organisation of the contractor. Due to governance responsibilities, Defence cannot rely on Performance Metrics as the sole means of monitoring contractor performance. Instead, a second tier of performance measures, called System Health Indicators (SHIs), is necessary to give **lead** indications of future performance trends and thereby facilitate proactive management of potential performance anomalies. In the same way that Performance Metrics reflect the effectiveness of the capability, SHIs are attached to critical processes the contractor uses for assurance of sustainable effective capability.
    - SHIs are largely lead indicators of future performance trends and therefore provide an opportunity for both Defence and contractor personnel to pro-actively manage a trend.
    - To ensure that standardisation and reduce re-work, ASD has identified a number of candidate SHIs. However, specific SHIs are not mandated by ASD as Defence does not intend to pre-empt the critical process solutions of the contractor. Instead, the process for development of SHIs would be contained in contracting process. Specific SHIs would be negotiated and agreed for each contract and managed within the contract's Performance Review processes.
    - Due to internal and external governance requirements, including legislative, there are some mandatory SHIs that must be reported.
    - SHIs are management aids, often process related, and the contractor is not paid against their achievement. This does not limit the right of Defence to impose responsibilities and/or standards on their achievement. In the absence of a payment driver, Defence can rely upon the Performance Review process and reporting tools such as the Company Scorecard to influence corrective action against negative trending of SHIs.

- An unsatisfactory trend in a SHI that is not corrected by management intervention, will eventually be reflected in the failure of the respective Performance Metric(s). As payment is attached to Performance Metrics and performance against SHIs may influence future contractual opportunities, this will provide the key driver for the respective contractor to actively manage SHIs.
- SHIs that measure Defence's performance in key process/outputs that influence contractor performance or cost should also be established.

CHOOSING A PERFORMANCE MEASURE

The final step in choosing a Performance Measure, regardless of whether it is a Tier 1 Performance Metric or a Tier 2 SHI, is carried out using the 3 principles in Table 1-5-1:

SIMPLE	The principle of simplicity is driven by the need to reduce the management oversight (including data collection) for contracts, facilitate understanding and limit friction in enforcing and interpreting Performance Measures.
MEANINGFUL	Outcomes may be achieved through a complex combination of Defence and contractor owned processes that can increase the ambiguity of results. This complexity can be avoided by the concentration on Capability Outcomes, in lieu of activities or outputs which were the foci of traditional functional specifications. Importantly, an Outcomes-based contract attempts to promote common objectives by tying payment to the achievement of *meaningful* performance objectives.
MEASURABLE	Many Defence priorities are not easily measurable, such as flexibility, responsiveness and foresight[6]. Accordingly, in developing Performance Measures, ASD Business Units should ensure that a measure of effectiveness can be identified and that the data collection is part of normal business practices and not an undue burden.

Table 1-5-1: Principles for Selection of a Performance Measure

[6] Taken from para 13 of *Future Joint Logistics Concept*, 2002.

CHAPTER 6 - STEP 3 – SET THE CONTRACTED LEVEL

GUIDING PRINCIPLES

The project life cycle is considered a continuum, with Capability ultimately being met as a performance outcome in-service. In practice this means there should be consistency between the following:

- Agreement Deliverables as expressed in the Materiel Acquisition Agreement (MAA) between Capability Development Executive and the Defence Materiel Organisation (DMO),
- Functional and Performance Specification (FPS) in the Acquisition Contract,
- Outcomes and Performance Metrics expressed in the sustainment contract, and
- Performance requirements in the Materiel Sustainment Agreement (MSA).

ASD supports these linkages by contracting for Acquisition and Sustainment simultaneously and, where separate Primes are selected, carrying over obligations between the two contracts.

The traceability of the Performance Metrics and their targets to the original user specification explains why ASD is fundamentally interested in ***meeting*** *rather than exceeding a performance baseline. In a resource constrained environment with high opportunity costs of capital, ASD needs to be convinced that exceeding a performance requirement represents value for money. This objective needs to be tempered against the need for flexibility and responsiveness to changing operational demands.*

GREENFIELD CONTRACTS

In the case of new, (or 'Greenfield'), capabilities, the Contracted Level should be based on the user requirements as identified in the various user documents mainly from within:

- the Operational Concept Document (OCD);
- the FPS in the Acquisition Contract; and
- the Logistic Support Concept (LSC).

This approach mirrors the principles of Systems Engineering which can be found in the Capability Systems Lifecycle Management Manual, or more generally, AS/NZS 15288:2003 :

Systems engineering - System life cycle processes. Illustration of this linkage can be found in Figure 1-6-1.

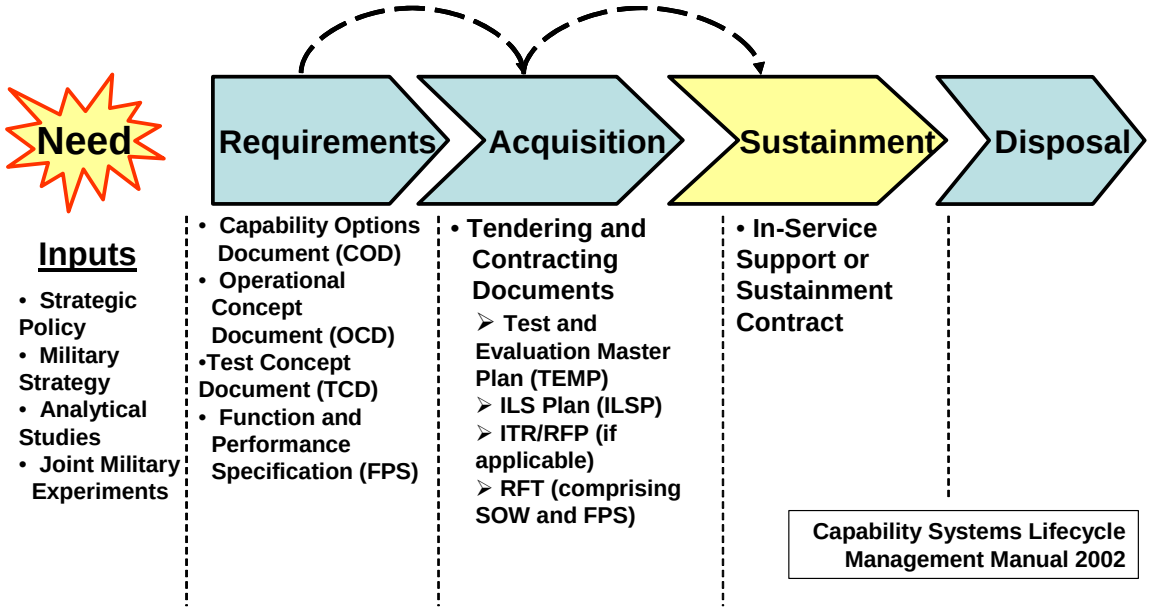


Figure 1-6-1: ASD PBC Contracted Level Linkages – Systems Engineering

LEGACY CONTRACTS

For existing (Legacy) contracts that are being transitioned from a Traditional Contractual Framework to a Performance Based (PBC) Framework, a review of the current level of performance delivered should be conducted in order to determine the required level of performance under PBC.

While it would be simple to state that the new PBC Contracted Level of Performance should at least be equal to the current level of performance, the comparison of the new PBC level relative to the legacy level is dependant on a number of factors including:

- the contract price,
- the contract scope, and
- any desired increase/reduction in current performance.

Accordingly, ASD Business Units must consider the following factors when determining new PBC Contracted Levels of Performance:

- Whether the current level of performance is satisfactory and is meeting the level of performance required to be delivered in the individual Materiel Sustainment Agreement (MSA).
- If a change to the current level of performance is required, there is a Business Case to support the variation in performance.
- In the case of an increase in performance, additional funding has been provided through the MSA.

The analysis of the current level of performance will require the ASD Business Unit to collect relevant performance data and undertake statistical analysis. While many personnel within the ASD Business Units have some level of training in probability and statistical analysis, given the potential criticality of this analysis to Defence Capability and Value for Money it is strongly recommended that ASD Business Unit seek advice, including peer review, from the ASD Reliability, Availability and Maintainability (RAM) Cell[7], on (02) 6265 1508.

[7] The ASD Reliability, Availability and Maintainability (RAM) Cell is responsible for the delivery of the Defence Reliability Management (DEFRELMAN) Course which includes instruction on probability and statistical analysis.

CHAPTER 7 - STEP 4 – DEFINE THE PAYMENT REGIME

GUIDING PRINCIPLES

The following are guiding principles in the development of the Payment Regime for a Performance Based Contracting (PBC) framework for each Performance Metric defined in Steps 2 and 3 of the six-step process described in Part 1 Chapter 3:

- The Payment Regime must drive the performance of the contractor to meet the strategic Outcomes, as represented by the Performance Metrics.
- Payments are made for contractor achievement against the Performance Target or contracted level of performance (this is not to be considered as an 'incentive' payment).
- Financial reward for performance above Performance Targets would not be made unless Defence requires the additional effort.
- The Payment Regime consists of having an 'At Risk' component of the Contract Price (comprising costs, overhead and profit) that is paid to the contractor in relation to achieved performance. Prescribing the 'At Risk' component as a function of the Contract Price ensures the Payment Regime can be used in contracting arrangements where the price is fixed, variable or some combination of both.
- Any component of the 'At Risk' margin that is not paid to the contractor due to under-performance against the Performance Target or contracted level of performance is retained by Defence.
- 'At Risk' Performance Payments are calculated at the end of each Review Period.
- The optimal length of the Review Period may be determined as the period where the variations in performance achieved are adequately characterised in the averaged value. If the Review Period is too short, there will be insufficient volume of work undertaken, and a subsequent insufficient set of performance data that may be unrepresentative of actual performance. If the Review Period is too long, there is risk to Defence that the average performance achieved will meet the target, and mask the under-performance or variations experienced during the Review Period that were unacceptable to the end-user.

Defence uses the fact that the contractor has money 'At Risk' against performance primarily to drive positive behaviour towards the achievement of key Outcomes, not to recoup contract value. Accordingly, Defence needs to be satisfied that the amount 'At Risk' is not undervalued to ensure that it has this effect.

It is expected that the contractor, at a minimum, will place the entire Contract Profit Margin at risk.

TRANSITION PERIOD

ASD Performance Based Contracting framework does not envisage the introduction of the performance Payment Regime until an appropriate baseline for average performance has been established. This would normally occur no later than 12 months from the delivery of the equipment, but more importantly should be tied to a realistic milestone to ensure that it does not delay the introduction indefinitely. Benefits from a Transition Period include the opportunity to bed-in support systems and reporting mechanisms, avoid initial and unrepresentative performance discrepancies and to properly gauge equipment Reliability. Importantly, performance measures and target levels are agreed and set at contract signature, prior to the transition period—transition periods are not to be used to vary pre-agreed performance measures and target levels. One possible model for scheduling a Transition Period is depicted in Figure 1-7-1.

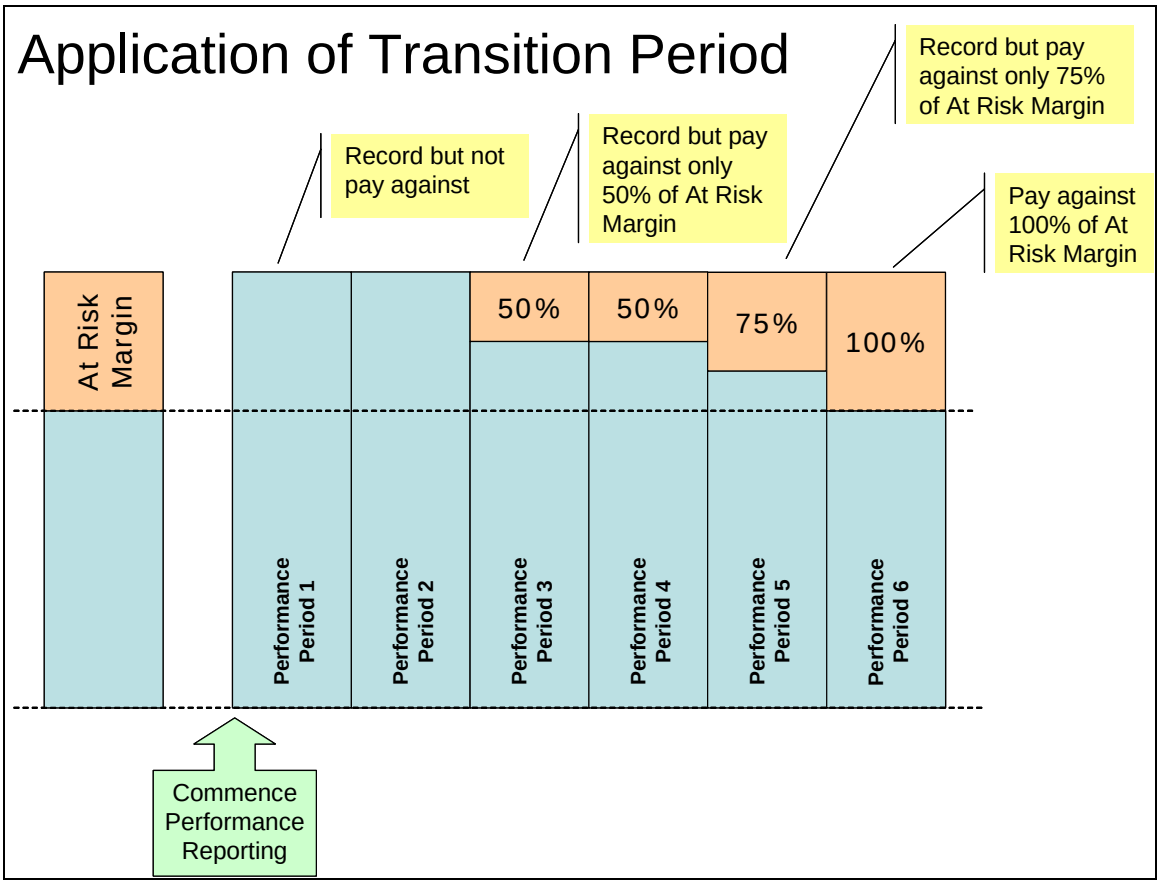


Figure 1-7-1: Application of Payment through Transition Period

For existing (legacy) contracts there should be no Transition Period to ensure there is no reduction in service due to a purely contractual construct change.

ASD Business Units are encouraged to negotiate a Transition Period which logically suits their particular delivery schedule, addressing the amount of the Monthly Service Fee, *At Risk* amount and any Incentive program which would apply at each stage. It may also be appropriate for the performance Payment Regime to be introduced for certain metrics (such as DSR) before other higher risk metrics where the Transition Period is needed to effectively offset that risk.

The Transition Period should not be viewed as a research phase for selection of appropriate Metrics or achievable Targets. The Metrics and Targets should be agreed prior to contract signature and the Transition Period is merely a validation of the accuracy and significance of the data, given possible transition problems.

CONTRACT PAYMENT REGIME

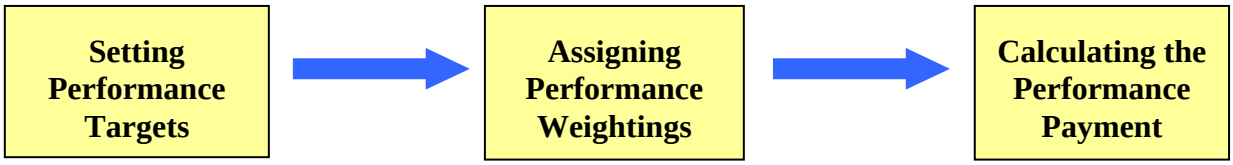


Figure 1-7-2: Steps in establishing a payment regime

As detailed above in Figure 1-7-2, the critical steps in establishing a Payment Regime are to set Performance Targets, assign Weightings and interpret results to determine the contractor's Performance Payment.

PERFORMANCE BANDS

The Performance Bands that ASD recognises are:

- **Band I - Minor Variation:** The first band is a small margin at the top end of the performance spectrum. For example, and for illustrative purposes only, ASD Business Units may consider an achievement of 80% or more of the contracted requirement for any Performance Metric as an acceptable Minor Variation and agree to pay the contractor in direct proportion to their performance in the range of 80% – 100% of the contracted requirement.
- **Band II - Major Variation:** The next band represents a level of contractor performance that while satisfactory in meeting minimal short-term tasking requirements, should be strongly discouraged. For example, ASD Business Units may consider the achievement of between 50% and 80% of any Performance Metric Target as representative of this range. As an increased disincentive, Adjusted Performance in this range falls faster than the actual decrease in Achieved Performance.

- **Band III - Exceedingly Poor Performance:** At the bottom end of performance, for example less than 50% of any contracted requirement, the value to Defence may be considered to be negligible and the contractor would not receive Performance Payment against that Performance Metric. Liquidated Damages may also be considered for negotiation at this point to address the damage to Defence resulting from the degraded level of performance.
- **Band IV - Exceeding Contracted Levels of Performance.** The final band of performance that may be included in the payment regime is that which exceeds the targets associated with 100% of the contracted level required. This band is optional depending upon the utility of the over-performance to Defence and, as a Performance Metric Incentive Arrangement, may be structured to allow for greater than 100% scoring and payment to the contractor. If a Performance Metric Incentive Arrangement is not included, average performance in excess of the contracted level required simply attracts 100% scoring and payment against that metric. Refer to Step 5 in Part 1 Chapter 8 for further discussion on other Incentive Programs not linked to Performance Metrics that may be considered.

Graphically, the Performance Bands can be shown in Figure 1-7-3 and Figure 1-7-4 noting that two forms of the graph exists. Figure 1-7-3 is used where any decrease in the level of achieved performance will be detrimental to the ASD and Defence outcomes and consequently result in a commensurate reduction in the adjusted performance. For example, consider Available Aircraft, where the contracted level of performance is 10 Fully Mission Capable (Contractor) (FMC(C)) aircraft on-line each day at 0900 hrs. As the contractor delivers less aircraft on average to Defence, the performance against this Performance Measure and the benefit to Defence capability reduces, and therefore so should the payment.

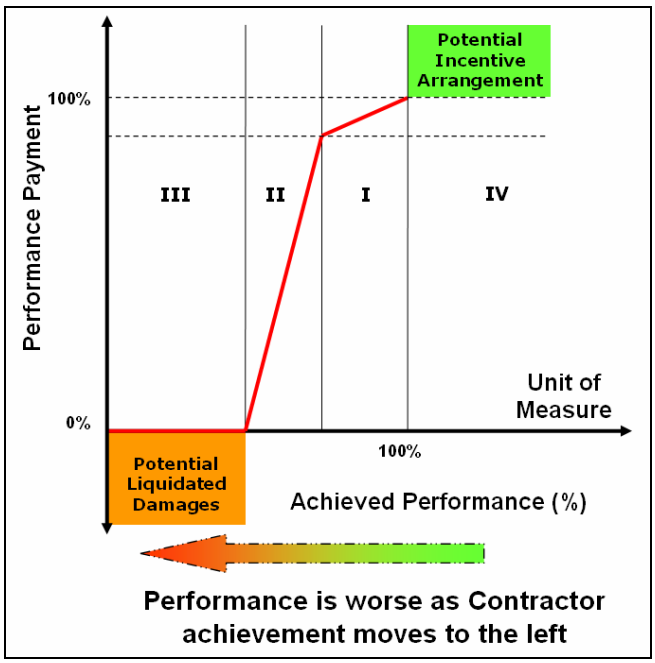


Figure 1-7-3: ASD PBC Linkages – Decreasing Performance, Reducing Payment

Figure 1-7-4 is the opposite where any increase in the level of achieved performance will be detrimental to the ASD and Defence outcomes and consequently result in a commensurate reduction in the adjusted performance. For example, consider Contracted Maintenance Turn-Around-Time (CM TAT) where the contracted level of performance averages 20 working days for an R1 servicing. As the contractor becomes late (increase in time (days)) with the delivery of the aircraft from maintenance, the performance against this Performance Measure and the benefit to Defence capability reduces, and therefore so should the payment.

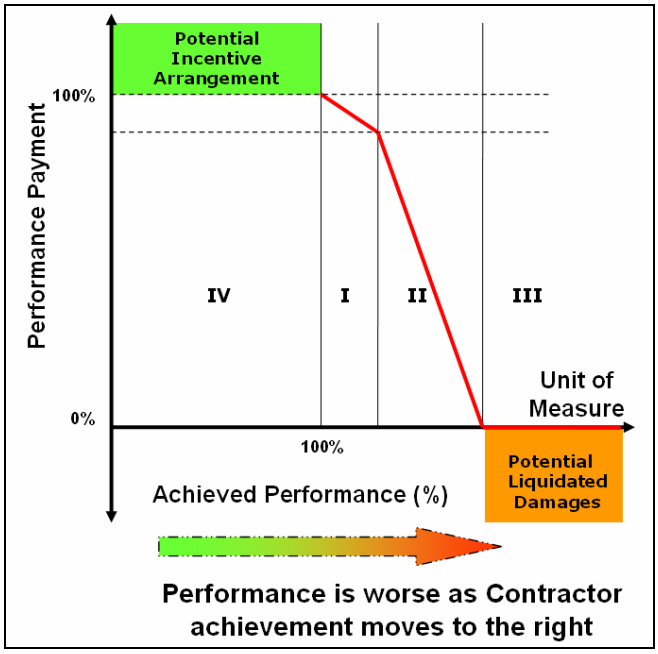


Figure 1-7-4: ASD PBC Linkages – Decreasing Performance, Reducing Payment

PERFORMANCE METRIC INCENTIVE ARRANGEMENTS

ASD normally expects the target levels for Performance Metrics to reflect the Directed Level of Capability (DLOC). However, there may be valid reasons for the contractor to exceed these target levels for certain Performance Metrics in certain circumstances.

As discussed above, Band IV Incentive Arrangements associated with Performance Metrics in the PBC framework should only be considered if (1) there is demonstrable utility to Defence, and (2) Defence has requested the over-performance. For example, it may be deemed that, for a certain period of time as requested by Defence, a greater number of available aircraft than the contracted level are required. In this instance, the performance payment regime could be structured to provide greater than 100% scoring and payment to reward the over-performance of the contractor.

Importantly, exceeding the contracted performance level required would normally be at the request of Defence to avoid the situation where, for example, additional aircraft are made available but Defence does not have the aircrew to utilise the capability. If the event of over-

performance during a reporting period occurs without Defence requesting it, the scoring of that over-performance would normally be limited to the 100% level.

LIQUIDATED DAMAGES (LDs)

A LDs strategy is required to enable an ASD Business Unit to gain due compensation for significant or excessive poor performance which causes damage to Defence.

The trigger for application of LDs is failure to achieve a specified minimum contracted level of capability—this minimum level would need to be negotiated on a case by case basis.

For the purposes of illustration, using Figure 1-7-3 as an example, LDs would be applied when the contractor failed to provide 50% of contracted Available Aircraft. The appropriate pre-agreed measure of damages may be expressed as a daily amount, per Available Aircraft achieved below 50% of the contracted level. The damages would be a reflection of the cost of providing the Capability from an alternate source (the commercial rate for daily hire of similar aircraft is often used as a starting point).

A financial limit on LDs is normally negotiated with the contractor. If that limit is reached or exceeded the Commonwealth has a right to terminate the TLS contract.

LDs are imposed on occurrence, rather than at the end of the Review Period or as part of the calculation of the Performance Payment, and become a debt to the Commonwealth under standard ASDEFCON language. This ensures that the LDs are available to provide immediate compensation to Defence.

When LDs are triggered, the Review Period may be adjusted by the number of days on which LDs applied and the contractor's average for the relevant Performance Metric is calculated over this reduced Period. For example, if LDs were imposed on 5 days in a 60 day Review Period, Achieved Available Aircraft would be calculated as an average over the remaining 55 days. The separation of LDs from the calculation of the relevant component of the Performance Payment ensures that the contractor is not penalised twice for poor performance in meeting the Performance Metric.

Annex:
A. Discussion of Fall of Performance Band

ANNEX A TO
CHAPTER 7
PART 1

DISCUSSION OF FALL OF PERFORMANCE BAND

The calculation of the *fall* (slope) of the Adjusted Performance Result for each percentage of Achieved Performance in the various bands (e.g. Minor, Major and Exceeding Poor) is a very useful technique of highlighting the relative impact of variation in the bands. Calculation of the *fall* (slope) is based on simple geometry where:

$$Fall = \frac{Rise}{Run}$$

In the example at Figure 1-7-A1 the *fall* for the Major and Minor Variation Performance Bands can be calculated as follows:

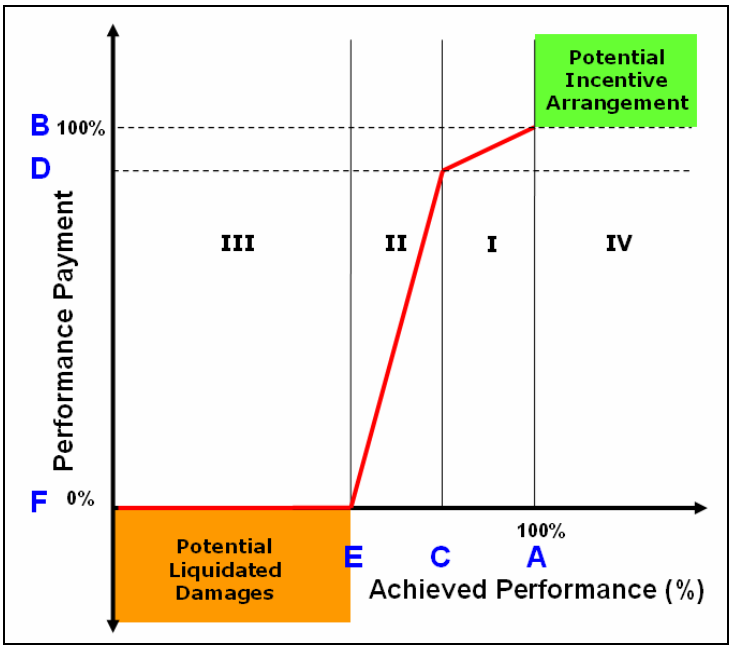
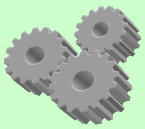


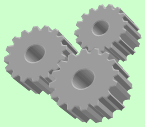
Figure 1-7-A1: Generic Performance Bands



BAND I – MINOR VARIATION PERFORMANCE BAND

$$Fall_{Minor} = \frac{Rise}{Run} = \frac{B-D}{A-C}$$
$$= \frac{100-80}{100-80}$$
$$= \frac{20}{20}$$
$$= 1$$

Therefore, within the Minor Variation Performance Band (100 – 80%) for each 1% fall in Achieved Performance in this Band results in a 1% reduction in the Adjusted Performance Result for the Metric.

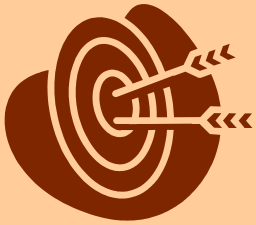


BAND II – MAJOR VARIATION PERFORMANCE BAND

$$Fall_{Major} = \frac{Rise}{Run} = \frac{D-E}{C-F}$$
$$= \frac{80-0}{80-50}$$
$$= \frac{80}{30}$$
$$= 2.67$$

Therefore, within the Major Variation Performance Band (80 – 50%), each 1% fall in Achieved Performance in this Band results in a 2.7% reduction in the Adjusted Performance Result for the Metric.

CHAPTER 8 - STEP 5 – DEFINE THE INCENTIVE REGIME



ASD GENERAL INCENTIVE PROGRAM

1. **ASD does not intend to mandate a particular Incentive Program.**
2. **This section does not discuss incentive arrangements in detail, but rather provides broad guidelines to assist in shaping an incentive arrangement.**

There is an opportunity in the absence of a mandated incentive arrangement, for ASD Business Units to allow contractors to propose a preferred approach which minimises the perceived risk of the entire performance management approach. This latitude could be bounded by a maximum financial value for any Incentive Program and the requirement to meaningfully contribute to Defence specified objectives. Contractors should also be encouraged to propose non-financial rewards.

GUIDING PRINCIPLES

Under a Performance Based contract, Defence contracts for the level of service required to meet the Directed Level of Capability (DLOC).

Outside this contracted level of service, there may be desired Outcomes and behaviours at both the strategic and business levels. These Outcomes may be candidates for Incentive Programs.

Guidance to identify candidates for Incentive Programs is provided in both the Australian Defence Aerospace Sector Strategic Plan and the ASD Strategic Plan.

When implementing an Incentive Program, there are a number of key points that are to be considered. The Incentive arrangement must:

- ensure that Incentives produce demonstrable value-for-money (VFM) benefits for Defence, while not compromising shareholder value for industry,

- not distract the contractor from meeting its obligations under the sustainment contract, and
- produce real and effective improvements to the support of the Capability.

Failure to perform against the Performance Metrics will be taken into account when considering Incentive Payments during the Review Period. The Performance Bands described in Chapter 6 could be use to determine when Incentives can apply. For example, a contract may specify that contractor performance must meet an average of at least Band II for Incentives to be available for that period.

Where appropriate, Defence managers should also consider enforcing similar Incentive Programs to their subcontract supplier base.

Incentive rewards can be both financial and non-financial, and the type of incentive chosen depends on the objectives and Outcomes that are required from the contractor.

INCENTIVE PROGRAMS

The Table 1-8-1 shows four ASD recognised candidates (Outcomes) for Incentive Programs with common performance monitoring strategies:

OUTCOMES	STRATEGIES
Australian Industry Capability	AIC Progress Reports
Relationship Factors	ASD Scorecard Performance Award Fee
Total Cost of Ownership	Periodic Cost Review Pain share/Gain share Efficiency Dividend
Continuous Improvement	Reliability Degrader Reports

Table 1-8-1: ASD Recognised Candidates for PBC Incentive Programs

These Outcomes and Strategies are discussed below.

OUTCOMES

Commitment to Australian Industry Capability

A key strategic level behaviour is the commitment of the contractor to the development of Australian Industry Capability (AIC). The Australian Defence Aerospace Sector Strategic Plan directs that a contractor must provide an Industry Plan in its tender response for a

sustainment contract, and that this Plan must demonstrate the strategies the contractor will employ in:

- identifying and developing sustainable capabilities to support the Government-directed defence self-reliance posture, including the through-life-support for defence aerospace platforms and systems;
- increasing its investment in local facilities and research and development, and the training of its workforce;
- adopting an industry capability team approach, including Small to Medium Enterprises (SMEs), to tender for Defence contracts and participate in global supply chains;
- applying the lessons learned from participation in past Defence contracts;
- ensuring the ongoing transfer of technology from overseas suppliers, and the protection of Australian intellectual property;
- diversification into non-Australian Defence markets to provide increased economies of scale and efficiency;
- participation in global supply chains; and
- nurturing of local SMEs.[8]

Relationship Management

Another important strategic behaviour is the efforts of the contractor to develop and sustain robust strategic relationships with the Commonwealth, its local SMEs, and key stakeholders. Outcomes which reflect these objectives could include:

- commitment to a corporate culture that values good working relationships;
- development and implementation of a Code of Conduct for engaging with other stakeholders including SMEs to optimise the achievement of specified Outcomes;
- development of support mechanisms to ensure optimum *responsiveness* to changes in requirements; and/or
- a pro-active management approach to identify opportunities where increased *flexibility* can be achieved.

Reduction of Long-Term TLS Costs

The following Outcomes can be used to develop an incentive arrangement with a contractor to reduce TLS costs over the life of the contract:

- minimise ongoing internal contractor costs of support to the Capability;
- reduce costs of supply chain arrangements, including engagement with SMEs; and/or
- achieve cost savings as a result of contractor innovation.

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[8] The Australian Defence Aerospace Sector Strategic Plan (2003) para 5.27.

Continuous Improvement

In return for the establishment of long-term TLS contracts, the contractor is expected to maintain world best practice within its business. 'Best practice' would be reflected in efficiency and effectiveness through i**nnovation** in the contractor's support solution.

STRATEGIES

There is a range of Reward options available to Defence, and ASD does not intend to mandate a particular program in this Handbook. The following are options for Reward Programs for the Incentive candidates described above:

AIC Progress Reports

ASD provides contractors with information on the structure of AIC progress reports and ongoing assessment criteria. This evaluation of progress could form the basis of an Incentive Program for Australian Industry Capability.

Incentive Programs for Relationship Factors

Historically, ASD have used two main tools in measuring and rewarding contractor behaviours. These are:

- ***DMO Company ScoreCard:*** The Company Scorecard is a performance measurement tool issued by the DMO to assess performance in areas that are fundamental to the successful delivery of the contracted service. Performance is measured against the categories and criteria set out in the 'Company ScoreCard Performance Parameters'. These parameters are flexible and can be used to describe a range of criteria including: Technical Performance, Australian Industry Capability (AIC), Contracting, Relationships, and Partnering. The opportunity to contribute to an assessment of contractor suitability for future contracts can make the Company ScoreCard an effective tool in promoting contractor performance.
- ***Award Fee:*** An Award Fee provides financial incentives for the contractor to provide better performance. Traditionally the contractor is scored in a range of areas, and the scores are consolidated and converted into a percentage. This percentage is applied to the money available for Incentive payment.

Total Cost of Ownership Models

A number of Total Cost of Ownership models are available for use and are dependent on assumptions about cost behaviours during a program and the rights of both parties to any efficiency savings. Some common approaches are described below:

- **Periodic Cost Review:** Under this arrangement, the contractor is permitted to keep any costs savings achieved from improved efficiencies in its support arrangements for a defined period. At the end of the agreed period (typically three to five years), a review would be held to assess the contractor's actual support costs. The ASD Business Unit

would then undertake a cost review of support costs in the contract to reflect these reductions. In this way, the support price is 'ratcheted' back to a lower level for the next period. Periodic Cost Review provides incentive for contractors to pursue efficiencies in order to enjoy the immediate benefits, while allowing Defence to recoup ownership costs in the medium term.

- **Pain share/gain share:** A 'pain share/gain share' model also requires Periodic Cost Reviews but operates on the premise that both parties share in the risks and rewards of cost changes during a program. Profit in the new period is affected by cost performance in the previous period, such that cost overruns result in a reduced profit for the next period, while cost savings are encouraged by higher profit margins for the next period. An example of such a model is shown below:

$$\text{Profit Margin}_{\text{New Period}} = (\text{Price}_{\text{Old Period}} - S \times (\text{Cost}_{\text{Old Period}} - \text{Cost}_{\text{New Period}})) / \text{Cost}_{\text{New Period}} - 1$$

Where:
- $\text{Profit Margin}_{\text{New Period}}$ = Profit Margin in New Period
- $\text{Price}_{\text{Old Period}}$ = Price in Old Period
- $\text{Cost}_{\text{Old Period}}$ = Cost in Old Period
- $\text{Cost}_{\text{New Period}}$ = Cost of New Period
- S = percentage (%) of pain share/gain share

- **Efficiency Dividend Programs:** In certain contracting situations it may be appropriate to build a predetermined cost reduction into the contract price. The cost reduction would occur at the Periodic Cost Review event and would not necessarily account for actual changes in costs during the period. A weakness in this approach is the risk that the efficiency dividend is built into the original contract price and does not act as an incentive to achieve efficiencies.

A potential weakness of any costing model is the reliability of the cost information available at the Periodic Cost Review opportunity. The model needs to account for cost changes in the outgoing period which have resulted from external factors such as modifications to the equipment or changing operating conditions.

Productivity or Process Improvement Models

As an alternate to focusing on cost, Incentive Programs can be used to pursue Continuous Improvement. Opportunities for productivity improvements are likely to be sensitive to the particular contracting situation. Accordingly, it can be beneficial to seek contractor suggestions on how to recognise and reward process efficiency.

- **Reliability Degrader Reports**: If equipment reliability is considered a high value objective for process efficiency, Reliability Degrader Reports, available from NetMAARS/CAMM2, could be used as a means of monitoring performance. These Reports highlight, in order of severity, where reliability of equipment has failed to meet Original Equipment Manufacturer's specification. Contractors could be rewarded for

their responsiveness and the success of corrective action (through redesign, change in maintenance concept, sparing analysis, etc) in restoring reliable performance.

FINANCIAL AND NON-FINANCIAL INCENTIVES

Incentives can be monetary or non-monetary, and should be positive but balanced, when necessary, with remedies for missing specific program targets or objectives. Certain Incentive Programs (for example, Total Cost of Ownership model) may lend themselves to financial incentives. However, ASD is keen to pursue non-financial rewards which may include:

- **Recognition schemes**: Consideration should be given to options for recognizing superior performance such as Letters of Commendation, Agency 'supplier of the year' award programs etc.
- **Off Ramps and Award Terms**: Contract duration can be used in a non-financial Incentive Program. Off-ramps are contract provisions which allow Defence to de-scope or terminate the contract for unacceptable contract performance. Alternatively, Award Terms are contract extensions which can be granted to recognise satisfactory performance as measured by Performance Metrics or other specified criteria. Consideration should be given to the competitiveness of the market for the contract services when using contract terms as incentives.
- **Future Work**: Past performance can be used as a discriminating factor in considering modifications, upgrade programs or new work.

CHAPTER 9 - STEP 6 – PUT PBC FRAMEWORK INTO CONTRACT CONSTRUCT

GUIDING PRINCIPLES

It is recognised that the Performance Management Framework described in Steps 1 – 5 can not *by itself* ensure performance. Accordingly, a number of other documents within the contract need to be amended, as depicted in Figure 1-9-1.

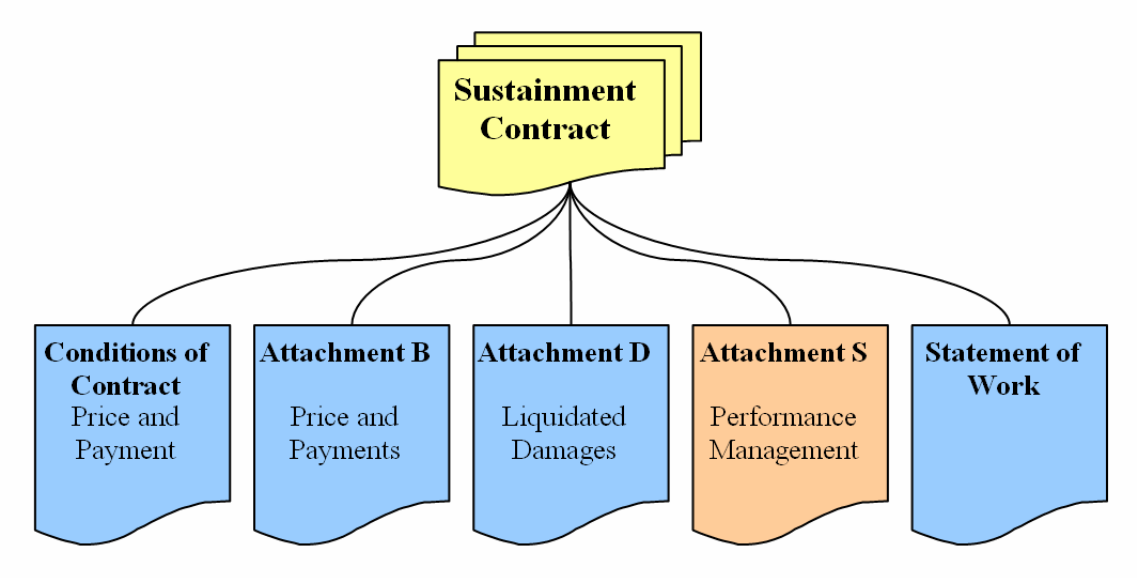


Figure 1-9-1: Performance Based Contract Construct

REPLACEMENT TERMS AND CONDITIONS

The following replacement terms and conditions may be considered for use to augment Section 7 in the Australian Defence Contract (ASDEFCON) Support Conditions of Contract:

- Permanent retention of money not paid by the Commonwealth due to reduced performance by the contractor.
- Incentive payments, regardless of whether delivered and used by the Commonwealth, will not be paid unless a minimum level of performance is achieved by the contractor.
- Poor performance for more than 2 consecutive reporting periods will result in “Stop Payment”:
  - Payment is withheld until the contractor has proven to the Commonwealth’s satisfaction that the issue has been resolved
- Poor performance for more than 3 consecutive reporting periods will result in a “Materiel Breach” resulting in Contract Termination

PART 2 - THROUGH LIFE SUPPORT CONTRACTS

CHAPTER 1 - GETTING STARTED – THROUGH LIFE SUPPORT CONTRACTS

INTRODUCTION

Part 1 of the ASD PBC Handbook described the application of the general process for developing and implementing a PBC Framework. Parts 2, 3, 4 and 5 of the ASD PBC Handbook then applies this general process for specific ASD Support Contracts including PBC principles to the Through Life Support (TLS), Contracted Maintenance (CM) Support, Repairable Item (RI) Support and Aero Engines Support contracts respectively.

DEFINITION

A TLS contract is an all encompassing contract that includes both the non-organic maintenance[9] (typically conducted by the Australian Defence Force) and System Project Office (SPO). Accordingly, the TLS contractor is responsible for the performance of maintenance, supply support and associated engineering services, and is likely to include Authorised Engineering Organisation (AEO) and Authorised Maintenance Organisation (AMO) responsibilities.

PERFORMANCE BASED CONTRACTING

Figure 2-1-1 is the core PBC Framework which *must* be used to develop a PBC approach for a TLS contract. This framework will be further detailed in Chapters 2 through 5 of this Part of the ASD PBC Handbook..

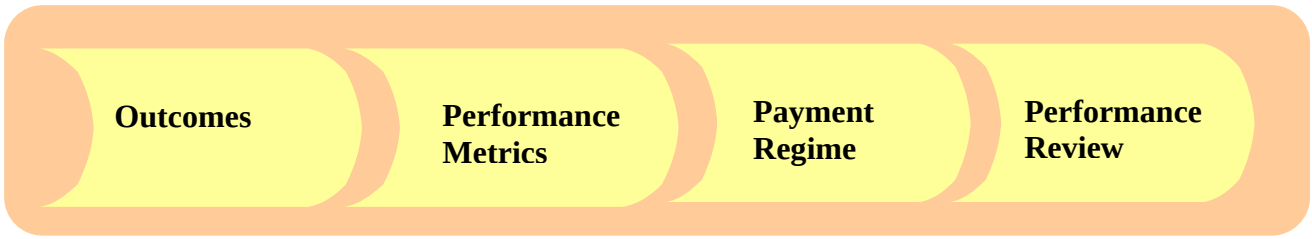
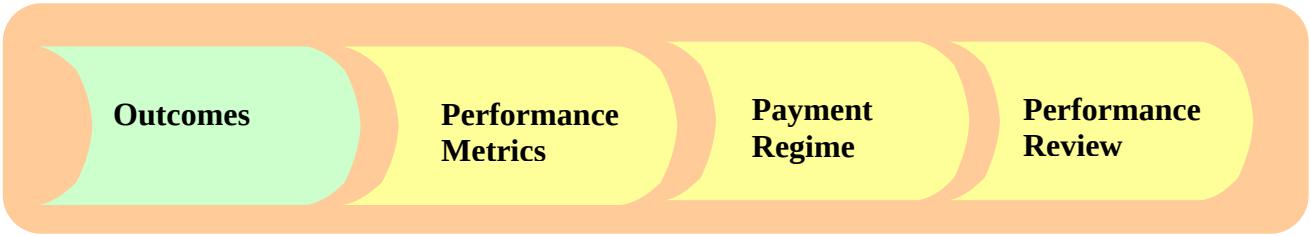
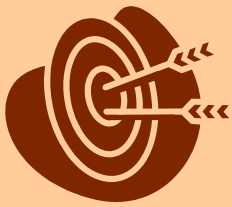


Figure 2-1-1: Performance Framework Schematic

[9] Defined in AAP 1004 Air Force Logistics Support Concept. Organic Maintenance are those services essential to direct operational support and/or required to be undertaken in the Area of Operations (AO).

CHAPTER 2 - THROUGH LIFE SUPPORT CONTRACT OUTCOMES





ASD TLS CONTRACT OUTCOMES

1. **Systems Readiness**
2. **Mission Success**
3. **Assurance of Supply**

ASD TLS OUTCOMES

Based upon an understanding of our support business and a review of current strategic guidance[10] the ASD Senior Leadership Group have agreed on **three** key Outcomes **that are mandated** as a minimum for all ASD TLS contracts. These Outcomes are *Systems Readiness*, *Mission Success* and *Assurance of Supply*.

Conveniently, these Outcomes align closely to US Office of the Secretary for Defense key objectives and the United Kingdom Ministry of Defence (MoD) philosophy of *Contracting for Availability*. Accordingly, there may be future opportunities for benchmarking and international best practice in pursuing these Outcomes.

SAFETY

While the focus of the ASD PBC Handbook is primarily on performance management, it does not reduce or negate the contractor's responsibilities to produce and maintain materiel to a specified level of safety as either as an Authorised Engineering Organisation (AEO) or as an Authorised Maintenance Organisation (AMO).

Table 2-2-1 describes the relationship of each Outcome to the applicable system characteristic and provides a short definition and explanation.

[10] Including the Aerospace Sector Plan, Air Force Logistics Support Concept and Future Joint Logistic Concept.

System Characteristics[11]	Outcome	Definition
Availability	**Systems Readiness**	The state of readiness of systems required to perform a specified mission or task.
Reliability	**Mission Success**	A measure of the ability of an item to perform its specified mission under stated operating conditions.
Supportability	**Assurance of Supply**	Confidence in the provision of the right materiel and services, at the right place, at the right time and with the right quality to sustain that support over time.

Table 2-2-1: ASD TLS System Characteristics and Outcomes

Systems Readiness

Aerospace operations can be characterised as time-sensitive, with limited mission duration and time-critical targets. Accordingly, the most important characteristic of an Aerospace Capability is its flight-line availability.

Mission Success

The continuous serviceability of a Capability throughout a mission is vital to successful operations and accurate Deliberate Planning[12] (eg: an assessment of how many F-111s are necessary to complete a strike without a critical failure). Consequently, Mission Success is a measure of the impact of equipment reliability on the probability of successfully completing a prescribed mission.

Assurance of Supply

Supportability is the degree to which all resources required to operate and maintain a product are provided. Assurance of Supply captures the confidence that Capability Managers have in the processes delivering Supportability. For ASD TLS projects, Assurance of Supply primarily concerns the delivery of Operational Maintenance spares, including Breakdown Spares (BDS), as performance in the supply support for Deeper Maintenance is captured by System Health Indicator such as Deeper Maintenance Turnaround Times (see Part 2, Chapter 3).

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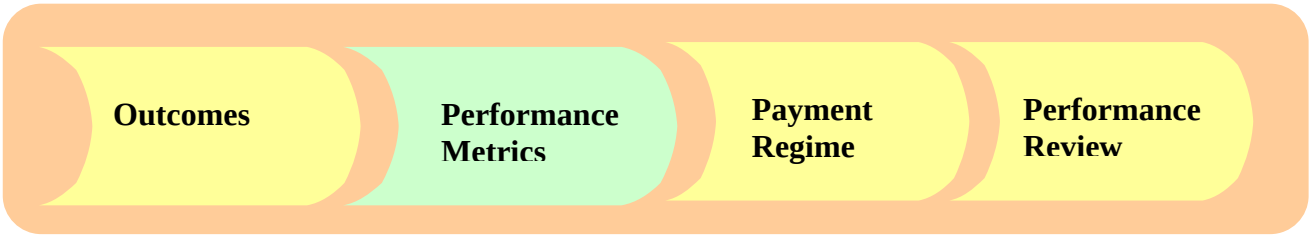
[11] A Performance Metric for Maintainability was not chosen as the ability to influence maintainability in the TLS period was considered to be limited. However, ASD Business Units should ensure that maintainability requirements are adequately, specified and tested as part of a Maintainability Demonstration Test in the Acquisition Contract compliance finding technique.

[12] AAP 1004, Air Force Logistics Support Concept, para 64.

CHAPTER 3 - THROUGH LIFE SUPPORT CONTRACT PERFORMANCE METRICS



ASD TLS PERFORMANCE METRICS

1. **Available Aircraft**
2. **Mean Time Between Critical Failure**
3. **Demand Satisfaction Rate**

ASD TLS PERFORMANCE METRICS

The Performance Metrics detailed in Table 2-3-1 are considered to provide an adequate assessment of their respective Outcomes and are therefore **mandated** for all ASD TLS contracts:

Outcome	Performance Metric	Definition
Systems Readiness	Available Aircraft	The number of aircraft in a prescribed configuration and serviceability level, excluding those awaiting Defence controlled processes or authorised decisions, at a nominated prescribed time or times.
Mission Success	Mission Reliability	The ability of an item to perform its required functions for the duration of a specified Mission.
Assurance of Supply	Demand Satisfaction Rate (DSR)	The percentage of successful delivery of Repairable Items and Consumables/Break Down Spares demands against contracted response times.

Table 2-3-1: ASD TLS Performance Metrics

Available Aircraft

Available Aircraft (AA)[13] can be defined in a number of ways;

- a percentage of aircraft from a fleet available at prescribed time(s) (e.g. daily at 9 am) that are available for Defence use,
- the total number of aircraft available at prescribed time(s), or
- Meeting a schedule daily Flying Program.

Central to the use of Available Aircraft (AA) within a contractual framework are two further requirements: firstly a prescriptive definition of Aircraft Configuration and Status and secondly, how to exclude Defence controlled processes.

Daily Flying Program. *In some cases a Flying Program may be more meaningful than aircraft on line. However, there are two difficulties in the use of a daily Flying Program based availability. The first difficulty is the flexibility to change the Flying Program due to late notice taskings. Given the reactive nature of military operations this is a very real issue. The second difficulty is that a Squadron will typically task aircraft on the basis of the number of aircraft maintenance staff have said can be made available. Clearly the lack of visibility of foregone missions defeats the intention of a performance based arrangement.*

Aircraft Configuration

Key to the metric of Available Aircraft is defining what is considered an available aircraft in terms of aircraft configuration (i.e. what systems are installed on/to the aircraft) and aircraft status (i.e. whether those systems installed on/to the aircraft are in an operational, degraded or non-operational state).

To determine aircraft configuration the ADF uses a Mission Critical Item List (MCIL) to define the aircraft systems, subsystems, and components required for specific missions. This ability to describe configuration for multiple mission types is very important since most aircraft have multiple roles (missions). This is equivalent to the Mission Essential Subsystem List (MESL) as used by the United States Air Force and described in para 2.25.1 of the

[13] The decision to label the metric Available Aircraft rather than Aircraft Availability was deliberate, to distinguish it from the conventional R&M definitions of availability (e.g. Inherent, Achieved and Operational Availability) which are defined in most R&M textbooks, and in US Department of Defence Military Standards/Handbooks.

(United States) Air Force Instruction (AFI) 10-602. For example, the A/P-3C Orion Maritime Patrol Aircraft can conduct Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW), Surveillance (e.g. fisheries, and coast/boarder patrol) and Search and Survivor Assist (SASA) missions. Accordingly, multiple MCILs need to be defined for specific mission types.

The Available Aircraft (AA) metric uses three major status condition codes as defined in [United States] Air Force Instruction 21-103[14]:

- ***Fully Mission Capable (FMC)*** – the aircraft is capable of doing all assigned missions;
- ***Partially Mission Capable (PMC)*** – material condition of an aircraft or training device indicating it can perform at least one, but not all, assigned missions; or
- ***Not Mission Capable (NMC)*** – the aircraft can not do any assigned missions.

For simplicity, ASD Business Units are encouraged to specify a Fully Mission Capable (FMC) MCIL to their TLS contractor. A FMC MCIL represents the most arduous mission scenario for any multi-role (mission) aircraft and therefore provides optimal functionality and operational flexibility for the operator. Alternatively, a series of mission specific MCILs can be specified; however, this will require a degree of forward planning and foresight to be able to specify the required configuration of all aircraft over a Review Period.

If a FMC MCIL is prescribed, the operator can choose to accept an aircraft that is not FMC but has sufficient systems available to be able to fly at least one mission safely. The aircraft would be considered Partially Mission Capable (PMC) and a reduced Performance Payment would apply (see Part 2, Chapter 4), noting that the reduction in payment does not need to be linear. All aircraft that are not FMC and not accepted as PMC would be classed Not Mission Capable (NMC).

The only exception to this classification is when an aircraft would be FMC but is awaiting the Defence controlled processes or decisions. In this situation it is possible to create a new definition Fully Mission Capable (Contractor), FMC(C). The (C) designation for FMC denotes that for the purposes of performance measurement in accordance with the Contract, the contractor shall have met all of its obligations to enable the Commonwealth to achieve FMC.

A process for calculating the Available Aircraft score, including FMC, PMC and NMC is attached at annex A.

Aircraft Status

While it is possible to determine the aircraft configuration using the MCIL structure defined above, the aircraft status is dependent on whether those systems installed on/to the aircraft are in an operational, degraded or non-operational state. Accordingly, a definition of failure needs to be prescribed and will be a key requirement for the Mission Reliability metric.

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[14] [United States] Air Force Instruction 21-103, Supplement 1, *Equipment Inventory, Status and Utilization Reporting*, [United States] Air Force Materiel Command, 8 December 2003

Most R&M textbooks[15], US Department of Defence Military Standards/Handbooks[16] and UK Ministry of Defence Standards[17] define what is considered a failure. However, it is strongly recommended that all contracts explicitly define failure(s) within the sustainment contract to avoid ambiguity, and therefore contractual dispute. As part of this definition two specific areas need to be addressed. Firstly, a process for sentencing failures in a controlled and repeatable manner needs to be defined. The second challenge is defining failure to enable responsibility to be attributed to the responsible party. Specifically failures need to be sentenced as:

- ***Chargeable*** – failure attributed to contractor activities/non-activities;
- ***Non-Chargeable*** – failure attributed to Defence activities/non-activities; or
- ***Undetermined*** – failures unable to be definitively attributed to either Defence or the contractor activities/non-activities at this point in time.

ASD has developed a Reliability Review Board (RRB) charter which defines the roles and responsibilities of both the Defence and the contractor in terms of sentencing failures and includes Failure Definition & Scoring Criteria (FDSC) document which defines failure types. The RRB charter contains a number of definitions and flowcharts to ensure consistency and is loosely based on the Failure Review Board (FRB) defined in US MIL-STD-785[18] Task 105.

While at first glance insisting on a Reliability Review Board may be considered a costly overhead for any sustainment contract, this much needed function within Defence is often an overlooked and under resourced activity. The output from the Reliability Review Board, specifically the Mean Time Between Critical Failure (MTBCF), is a vital input into the safe, effective and efficient operation of the aircraft platform. Examples of where the output from the Reliability Review Board impacts a number of critical activities includes the Mission Reliability outcome, Servicing Intervals and Lifing, Operational Mission Planning, Spares assessments, Life Cycle Costing (LCC) modelling, etc. Accordingly, by including the availability and reliability metric in the PBC concept, ASD promotes these behaviours from the contractor.

A copy of the latest version of the Reliability Review Board (RRB) charter, including the Failure Definition & Scoring Criteria (FDSC) document, can be obtained Aerospace System Division (ASD) Performance Based Contracting (PBC) cell on telephone +61 (0)2 6265 5418.

Excluding Defence Controlled Processes and/or Authorised Decisions

The second requirement for the use of Available Aircraft is a method for excluding Defence controlled processes and/or authorised decisions. Given that military aircraft, and consequently their support staff, deploy into potentially hazardous environments Defence

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15 Ebling, C.E., An Introduction to Reliability and Maintainability Engineering, McGraw-Hill, USA, 1997

16 Military Standard 721C – Definition of Terms for Reliability and Maintainability, 12 Jun 1981

17 [United Kingdom] Ministry of Defence - Defence Standard 00-40 (Issue 1), Reliability and Maintainability (R&M) Part 7 (ARMP-7) - NATO R&M Terminology Applicable to ARMPs, Date 6 June 2003

18 [United States] Military Standard 785B (MIL-STD-785B), *Reliability Program For System and Equipment Development and Production*, 15 September 1980

retains Operational, or first line, Maintenance (OM) of the aircraft and associated equipment. Defence may also undertake activities such as inventory management of multi-use or classified equipment. Additionally, Defence retains authority for certain technical (e.g. Request For Deviations (RFDs)/Waivers (RFWs), etc) and contractual (e.g. Latent Defect resolution, etc) decisions. Similar to the Reliability Review Board charter, a process, including a flowchart, has been developed by ASD to explicitly exclude Defence controlled processes and/or authorised decisions for this measure.

A process for calculating the Available Aircraft score, including the method for excluding Defence controlled processes and/or decision is attached at annex A. Unlike Mission Success and Demand Satisfaction Rate there may be two aspects of measuring Available Aircraft centred around a daily minimum number of Available Aircraft. The two aspects are:

- Average Available Aircraft over the entire reporting period, and
- Individual daily minimum Available Aircraft requirements.

Causal analysis to ensure that Defence controlled processes are excluded from the Available Aircraft metric is an additional burden and risk to Defence and the contractor. However, there is a tangible benefit to the Defence that the root cause of aircraft unserviceability is determined regardless of whether it is attributed to Defence or the contractor. From the overall generation of Capability, this casual analysis is an important activity.

Mission Reliability

While Available Aircraft concerns the operable state of an aircraft at the commencement of a mission, Mission Reliability measures its ability to perform required functions for the duration of the specified mission. The key to this metric is the definition and sentencing of failures, and access to a Mission Reliability Model such as a Reliability Block Diagram (RBD). As previously discussed this is the role and responsibility of the RRB.

Also important to this metric is the duration of the MTBCF review interval. The review period must ensure that sufficient time (exposure) has elapsed to generate a statistically significant sample size for the MTBCF, while preserving visibility of important variability in results. ASD currently use the results from a fixed length test plan in MIL-HDBK-781A[19] based on a 10% consumer/producer risk where 18.8 x MTBCF is required to ensure that there is a statistically significant sample size.[20]

The Metric relies on the ability of the Maintenance Management System (MMS), CAMM2 and NetMAARS for Defence solutions, to count critical failures (as annotated in the MCIL). These failures in conjunction with total mission time for the fleet, automatically generates a system level MTBCF using a Mission Reliability Model of the system. To ensure that

[19] [United States] Military Handbook 781A (MIL-HDBK-781A), Handbook for Reliability Test Methods, Plans, and Environments for Engineering, Development, Qualification, and Production, 1 April 1996

[20] There is debate as to whether the required time is based on lower level component MTBCFs or is at the aircraft level. Defence contends that in all projects, not just aerospace, MTBCF should be measured at the highest level (e.g. aircraft) since this is the level at which Defence will typically contract. In the specific case of the Through Life Support contract case of the ASD PBC Framework the recording and reporting of the MTBCF at the platform level is a reasonable expectation.

sufficient data has been recorded to allow a fair comparison of the contractor's MTBCF performance at the end of each Review Period against the requirement, it is expected that the MTBCF data will be reported using a rolling program of the most recent 12 months of aircraft data from the MMS.

A process for calculating the Mean Time Between Critical Failure score, including the method for excluding "non-chargeable" failure (i.e. failures occurring due to the direct result of Defence) is attached at annex B.

Demand Satisfaction Rate

The final metric is Demand Satisfaction Rate (DSR), which is defined as the percentage of successful delivery of Repairable Items and/or Consumables/Break Down Spares demands against contracted response times. DSR is an amalgam of all demands placed on the logistics system based on priority and respective delivery times. The calculation of DSR is an automated function of the Australian Standard Defence Supply System (SDSS) a military variant of Version 4.3.1.2 of the MINCOM software package MIMS. As with Available Aircraft, the main problem with the implementation and use of DSR is excluding Defence controlled processes. For example, a contractor cannot control the use of the ADF logistics system for transportation of spares or the delay caused by ADF OM personnel in inducting a failed component into the contractor's maintenance venue.

Clearly Demand Satisfaction Rate is most effective when the contracted supply chain does not interface with the ADF logistics processes. For example, when OM personnel obtain repairable and consumable spares from a local store, delivery can be measured from the contractor's warehouse to this flight line facility eliminating the interface with the ADF transportation system. However, care needs to be taken that contractor processes do not compromise Defence's requirements for visibility and coordination of supply support.

A process for calculating the Demand Satisfaction Rate score, including the method for excluding Commonwealth activities is attached at annex C.

Representative Set of ASD TLS Systems Health Indicators

Although a guiding principle in the development of SHIs is that ASD would not mandate specific metrics, there are some SHIs that logically emerge from the Performance Metrics selected for the ASD TLS contract model. In order to reduce the burden of data collection, ASD Business Units should also include relevant metrics from their Materiel Sustainment Agreements (MSA). A representative set of these SHIs is described in annex D and may provide a useful starting point to negotiations.

Annexes:

A. Available Aircraft Scoring Process
B. Mean Time Between Critical Failure Scoring Process
C. Demand Satisfaction Rate Scoring Process
D. Representative Set of ASD TLS Systems Health Indicators

ANNEX A TO
CHAPTER 3
PART 2

AVAILABLE AIRCRAFT SCORING PROCESS

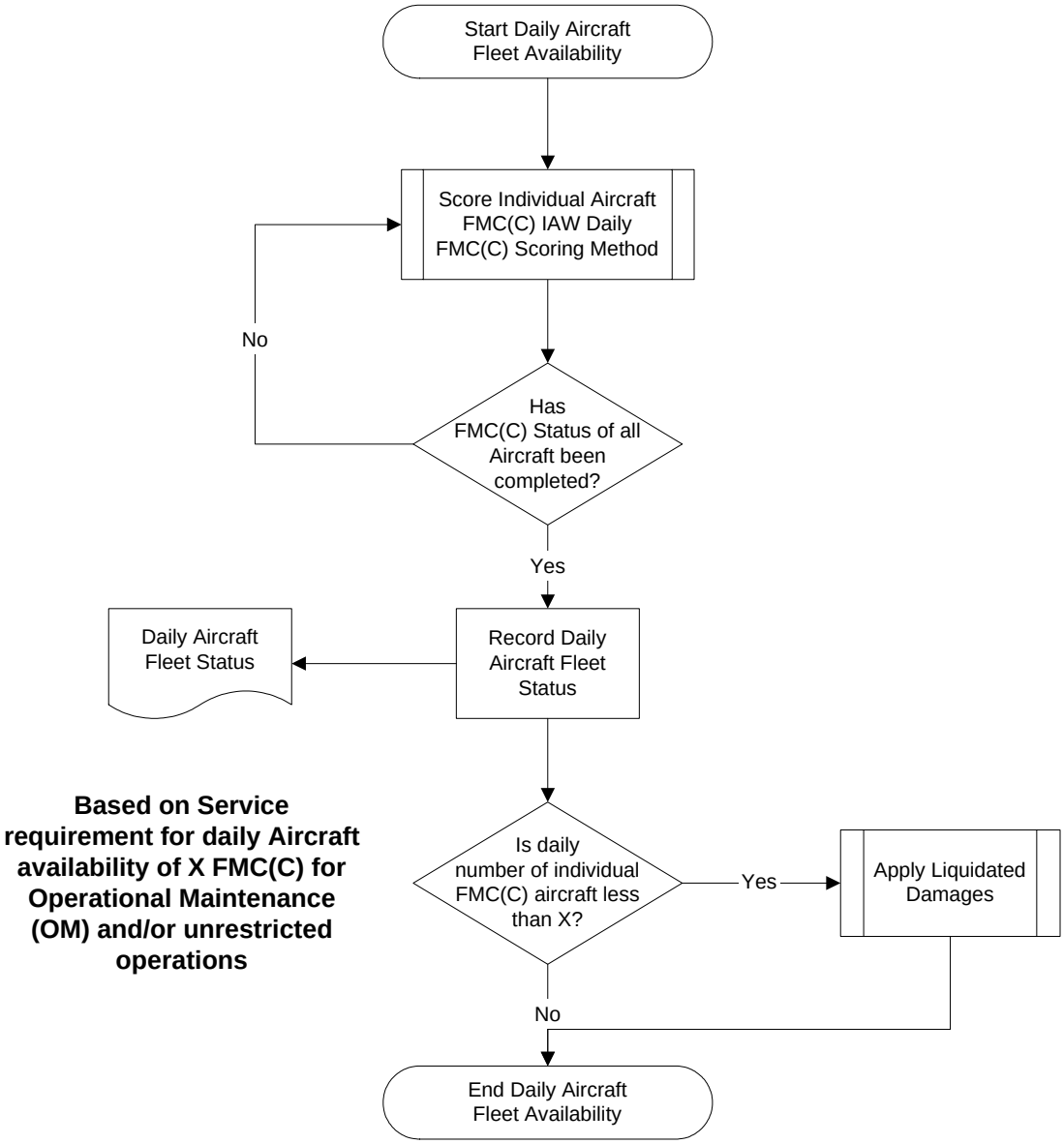


Figure 2-3-A1: Process for scoring Daily Aircraft Fleet Availability

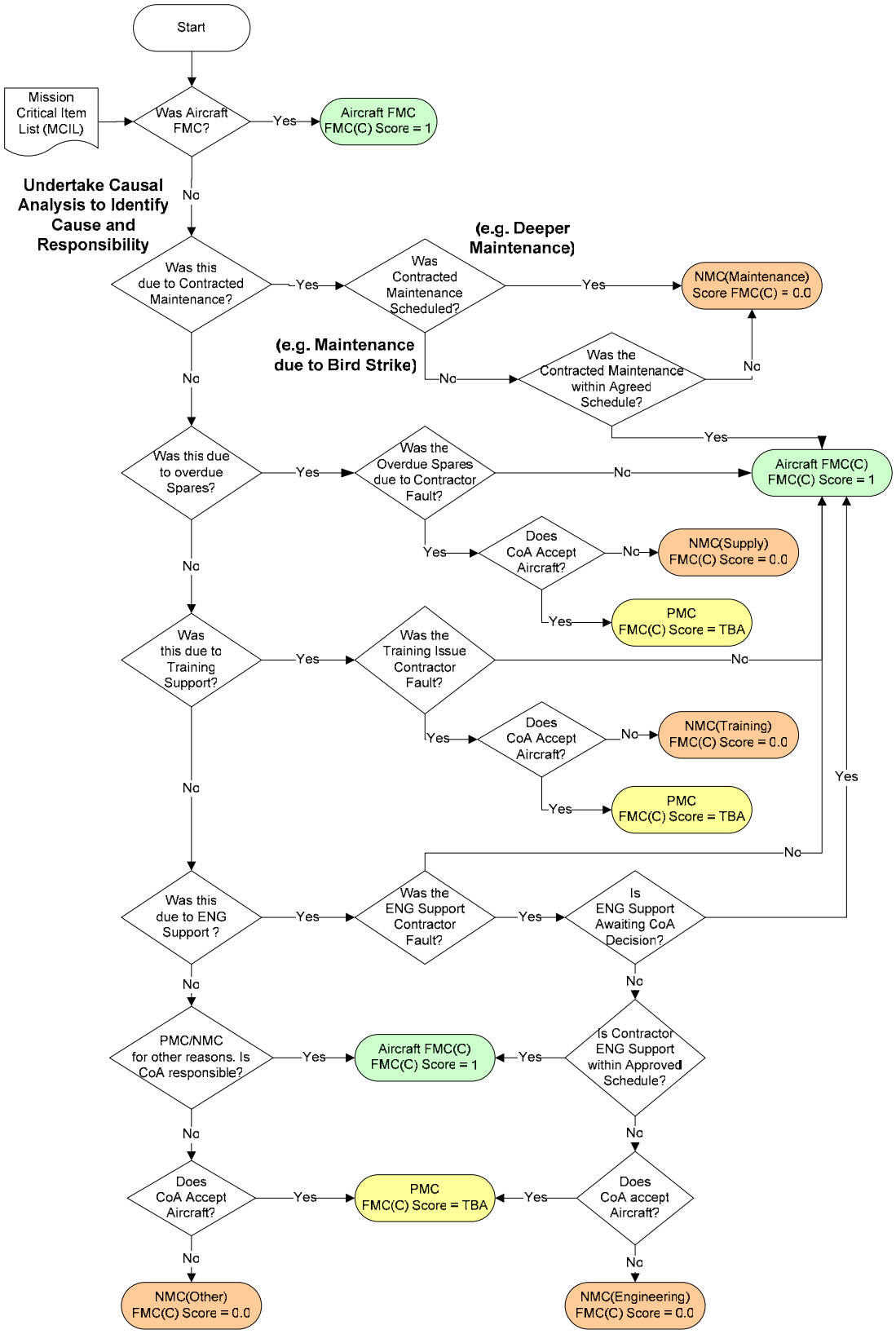


Figure 2-3-A2: Process for scoring Daily Individual Aircraft Available

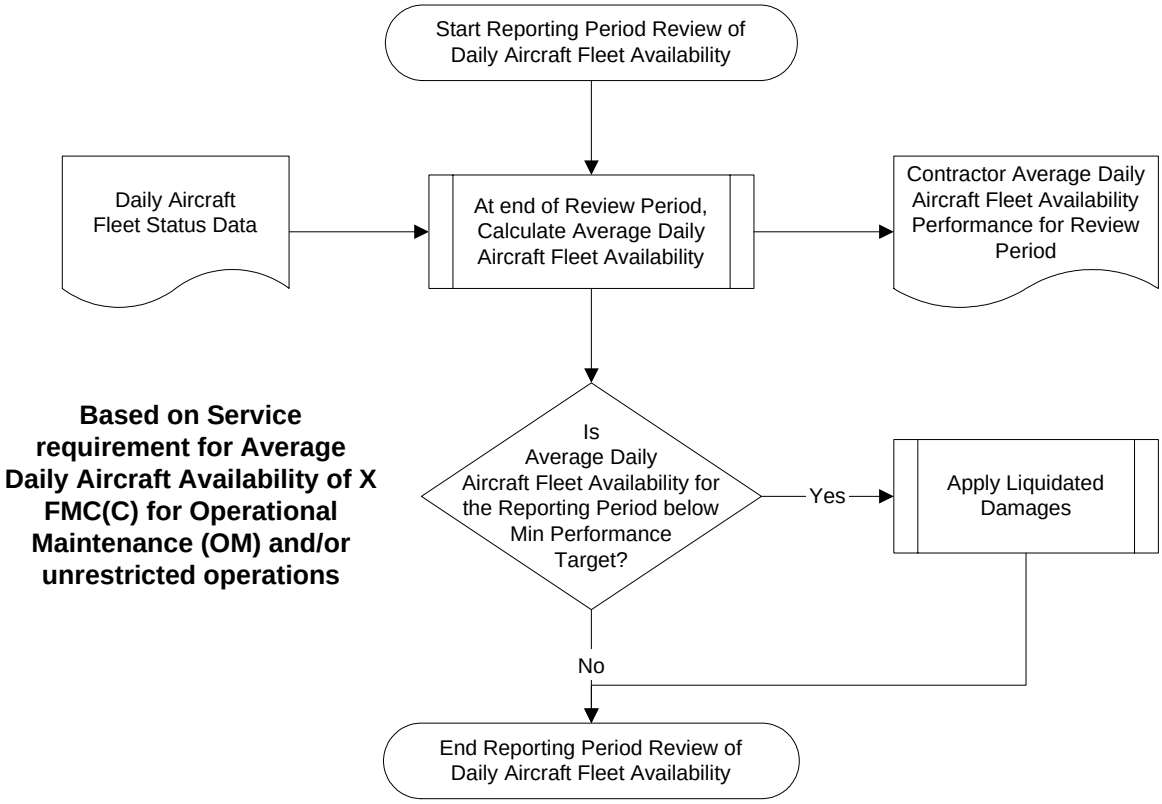


Figure 2-3-A3: Process for scoring Average Daily Aircraft Fleet Availability

ANNEX B TO
CHAPTER 3
PART 2

MEAN TIME BETWEEN CRITICAL FAILURE SCORING PROCESS

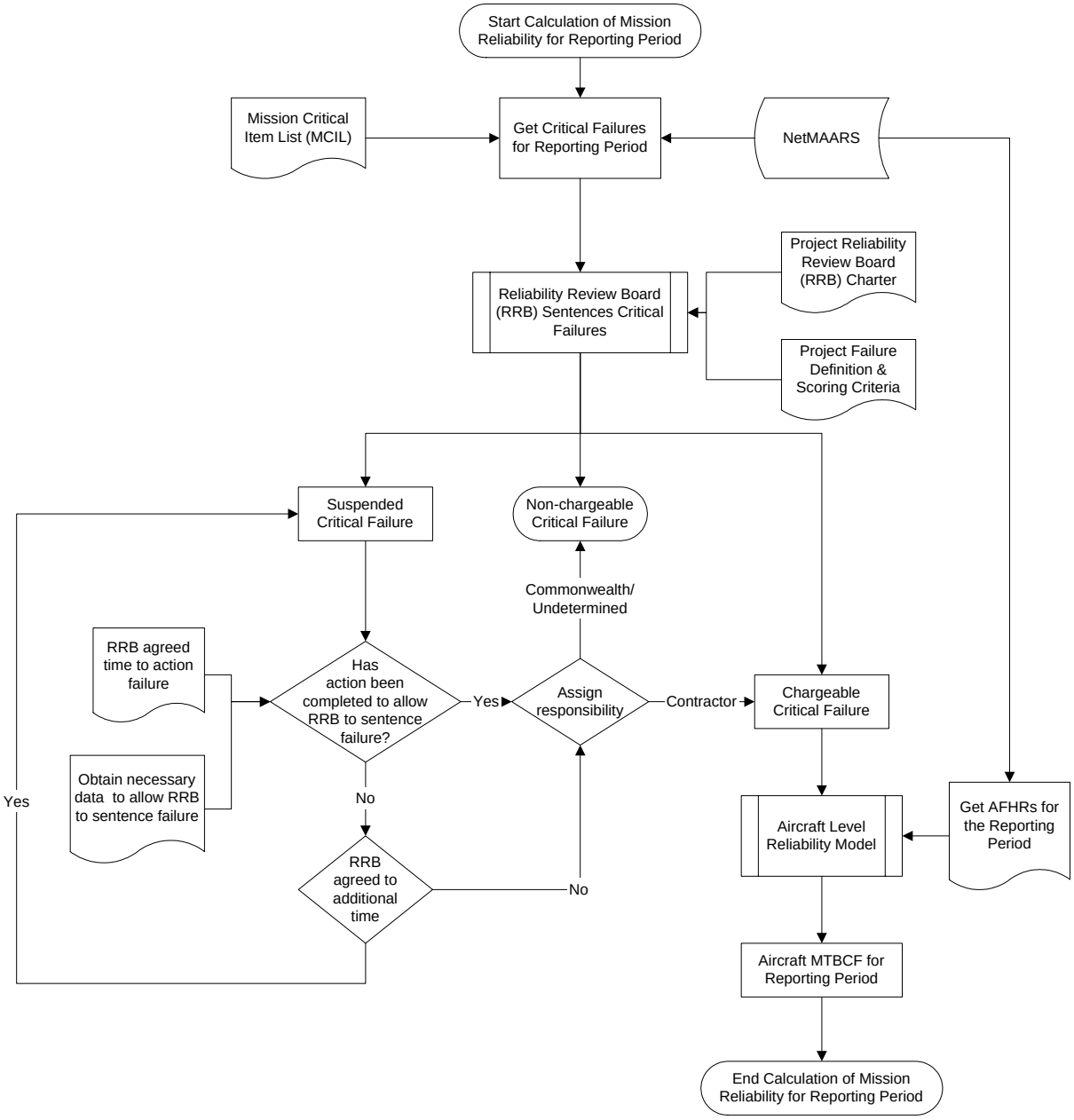


Figure 2-3-B1: Process for scoring and calculating Mean Time Between Critical Failure

ANNEX C TO
CHAPTER 3
PART 2

DEMAND SATISFACTION RATE (DSR) SCORING PROCESS

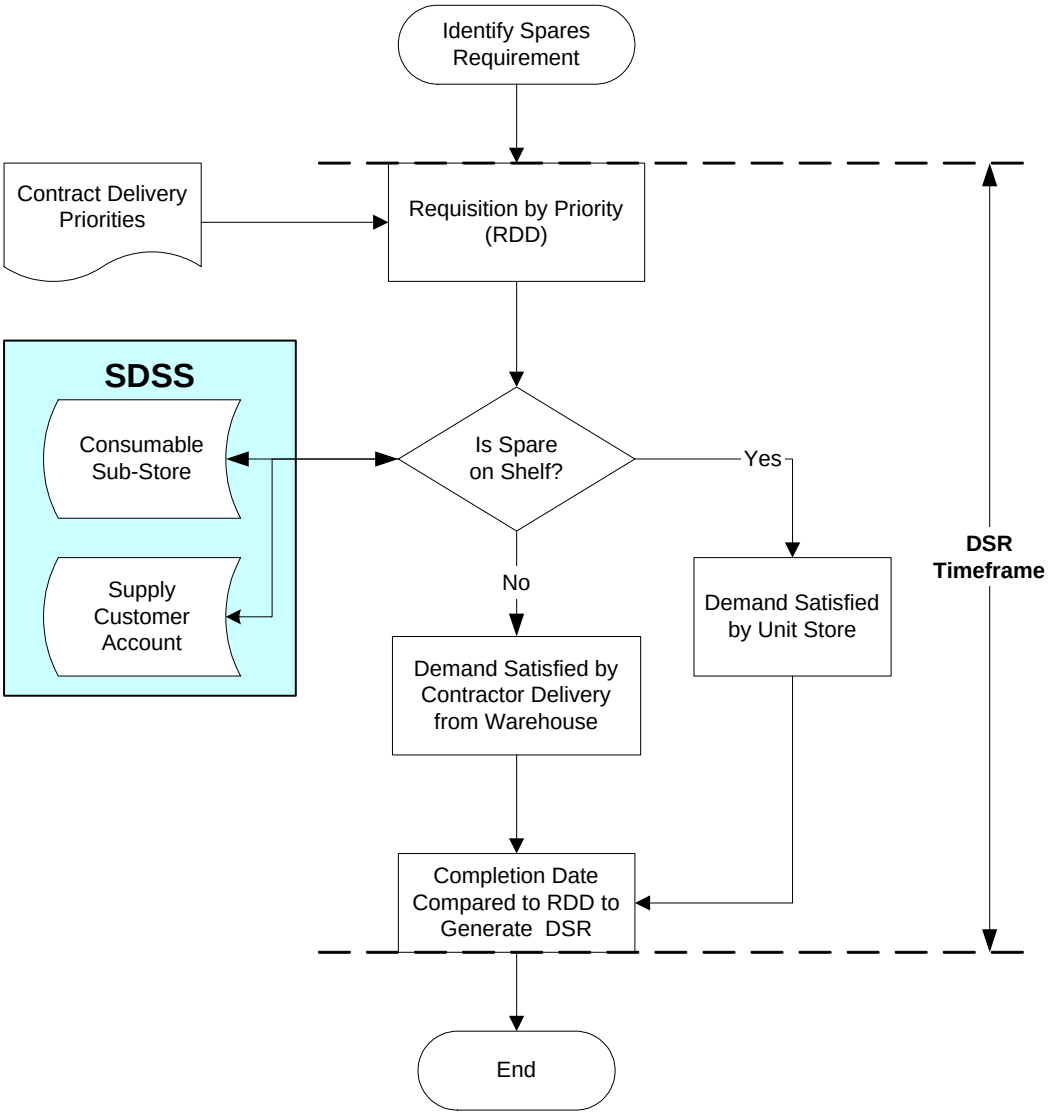


Figure 2-3-C1: Process for scoring and calculating Demand Satisfaction Rate

ANNEX D TO
CHAPTER 3
PART 2

REPRESENTATIVE SET OF ASD TLS SYSTEMS HEALTH INDICATORS

Metric	Definition	Data Source
Engineering Services		
Projected ROE	ROE is lead indicator of the achievement of future flying programs; measured monthly against the scheduled flying program. The prediction is based on the past performance of Available Aircraft and Mission Success achieved by the contractor.	Predicted ROE is based on future fleet Availability, from *FleetDoctor*, and Mission Reliability in terms of MTBCF from NetMAARS.
MTBF	Total number of AFHRs accumulated during the observation period (e.g. month) divided by the total number of failures. By considering all failures, MTBF is an indicator of the arising (and therefore throughput) rate of the Support System, i.e. failures resulting in maintenance actions and/or logistics demands. This is a fundamental input into spares determination and LCCA.	NetMAARS
MTBF-CI	Total number of AFHRs accumulated during the observation period (e.g. month) for CI's only, divided by the total number of failures. A CI is defined as any item listed in the Mission Critical Item List (MCIL). Provides visibility of equipment-level degraders as potential opportunities for improving overall system performance.	NetMAARS MCIL
Top 20 Reliability Degrader Report	Using the MTBCF model, typically a Reliability Block Diagram (RBD), it is possible to generate a report on the top 20 Reliability Degrader in terms of the effect of the reliability of individual components on the overall system Mission Reliability (e.g. MTBCF). The report should use historic reliability trends to predict future reliability trends of components. The report should also specify whether the component reliability is within OEM specifications and, if necessary, detail contractor action such as warranty repair, change of maintenance internal, etc.	MTBCF NetMAARS.

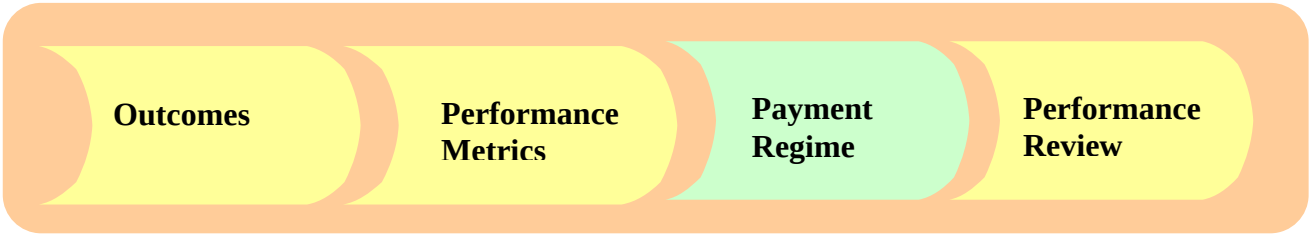
Metric	Definition	Data Source
No of Outstanding CARs	A comparison of the resolution of the CARs for both AEO and/or AMO versus the assigned schedule. As an external accreditation process, AEO/AMO status ensures the quality of contractor engineering and maintenance services.	DGTA audit report from DGTA-DAIRENG or DGTA-DAIRMAINT as appropriate
Total Number of Logistics Processes	Technical Information becomes a Logistic Process when it is considered relevant (i.e. requiring further action by the ASD Business Unit/contractor) to the system. Within EMERALD Logistics Processes are defined as all processes that require an engineering decision such as RFDs, RFWs, ECPs, STIs, publication amendments, modifications, etc. Total Number of Logistics Processes provides an indication of the workload, and by analysis, a measure of the excess capacity of the contractor and/or ASD Business Unit work force.	EMERALD Data Reporting Tool (when used). *Note: the use of EMERALD is not mandatory IAW AAP 7001.053(AM1). However, Regulation 3.5.2 from AAP 7001.053(AM1) requires that all Technical Information is captured (e.g. action, date, etc).*
Outstanding Number of Logistics Processes	Technical Information becomes a Logistic Process when it is considered relevant (i.e. requiring further action by the ASD Business Unit/contractor) to the system. Within EMERALD Logistics Processes are defined as all processes that require an engineering decision such as RFDs, RFWs, ECPs, STIs, publication amendments, modifications, etc. Outstanding Number of Logistics Processes are the total number of Logistics Processes that exceed the estimated completion date. This measure provides an indication of the efficiency, and therefore, adequacy of the contractor and/or ASD Business Unit work force.	EMERALD Data Reporting Tool (when used).

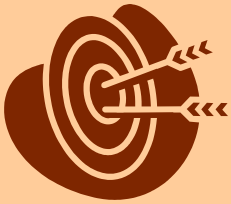
Metric	Definition	Data Source
Maintenance Services		
MTTR	Total time taken for Corrective Maintenance actions divided by total number of Corrective Maintenance actions. Together with the MaxTTR-CI, the MTTR ensures that the outlying Corrective Maintenance times are visible.	NetMAARS
No of Outstanding Pub Amendments	A comparison of the TAT achieved versus TAT required under the contract. This metric recognises the critical role of publication currency on Aircraft availability and safety.	Contract PIRR EMERALD Data Reporting Tool
DM TAT	A comparison of the DM TAT achieved (measured from Acceptance by Defence) versus DM TAT required under the contract. This is to provide a lead-indication of Available Aircraft and is particularly relevant when the scheduled flying program is not available.	Contract FleetDoctor
TAT CIs	TAT CI is the comparison between the contracted and actual repair times for critical items. This is to provide visibility of the repair rate in support of the arising rate (i.e. MTBF) as significant constituents of DSR.	Contract to report by serial number for critical items
No of RIs fail on fitment	No of RIs Fail on Fitment is the quantity of RI's provided to the Commonwealth by the contractor that fail with zero airframe hours. It is a measure of the quality of the contractor repair and is not captured within the MTBCF or MTBF values.	Can be filtered from NetMAARS data. Currently no automated report.
Maintenance hrs/flying hour	Maintenance hrs/flying hour is an efficiency measure of the maintenance effort. Maintenance hrs refers to the total number of maintenance activities, both corrective and preventative.	NetMAARS
Support and Test Equipment	The total number and serviceability status of all Support and Test Equipment necessary to support the system. This reflects the possible critical nature of S&TE to conducting operations.	No common data source, although likely to change in near future (refer to AESSO for update). However, could be reported as a management issue.

Metric	Definition	Data Source
MaxTTR-CI	MaxTTR-CI is the maximum time required to complete a specified percentage of all corrective maintenance actions on critical items. As it refers to repair activities (i.e. Corrective Maintenance) it can positively influence the level and complexity of Operational and Contingency Maintenance activities.	CAMM2
Supply Support Services		
Average waiting time	The average time taken to satisfy SDSS demands. This is a necessary accompaniment to DSR to ensure that all items fall within acceptable time limits.	SDSS
Cannibalisation Rate	Number of items cannibalised divided by AFHRs accumulated during the observation period, resulting in the number of cannibalisations per AFHR. While DSR measures the efficiency of the Supply Chain, the cannibalisation rate gives visibility of demands satisfied outside the Supply Chain and is therefore an indicator of the Chain's health.	NetMAARS
AOG Inabilities	The number of high priority (UNDA/AOG) inability demands registered on PIASS. The availability of items which directly impact operations merit particular visibility. This management attention improves the effectiveness and resupply of items to minimise inabilities in the future to unforeseeable requirements.	PIASS (Priority InAbility Support System)
Failed Outstanding Demands	A measure (number and duration) of the customer demands whereby the Required Delivery Date (RDD) has passed and the demand has not yet been satisfied.	AIMS BART
Inventory Balance	A measure of inventory availability relative to demand.	AIMS BART
Forecast Accuracy	A measure of the degree of alignment between the forecast customer demands for a period and the actual customer demands for the same period.	AIMS BART
Contingency Equipment List	A measure of on hand serviceable stock against a prescribed Contingency Equipment List.	AIMS BART

Metric	Definition	Data Source
Training Services		
Outstanding training days per observation period	The contractor's training allocation in an observation period is compared to the training actually performed during the period and, where there has been a shortfall, a satisfactory explanation and mitigation program is provided. This reflects the potential for training deficiencies to impact Available Aircraft and/or maintainability.	Analysis

CHAPTER 4 - THROUGH LIFE SUPPORT CONTRACT PAYMENT REGIME





ASD TLS WEIGHTINGS:

1. **50% for Available Aircraft**
2. **30% for Mission Reliability**
3. **20% for Demand Satisfaction Rate**

TRANSITION PERIOD

ASD Performance Based Contracting framework does not envisage the introduction of the performance Payment Regime until a baseline for performance has been established. This would normally occur no later than 12 months from Acceptance but more importantly should be tied to a realistic milestone to ensure that it does not delay the introduction indefinitely. Benefits from a Transition Period include the opportunity to bed-in support systems and reporting mechanisms, avoid initial and unrepresentative performance discrepancies and to properly gauge equipment Reliability. Importantly, performance measures and target levels are agreed and set at contract signature, prior to the transition period—transition periods are not to be used to vary pre-agreed performance measures and target levels.

The Transition Period should not be viewed as a research phase for selection of appropriate Metrics or achievable Targets. The Transition Period is merely a validation of the accuracy and significance of the data, the method of recording and reporting the data given possible transition problems. Accordingly, the Metrics and Targets should be agreed prior to contract signature

One possible model for scheduling a Transition Period is provided below in Figure 2-4-1. ASD Business Units are encouraged to negotiate a Transition Period which logically suits

their particular delivery schedule, addressing the amount of the Monthly Service Fee and At Risk amount. It may also be appropriate for the performance Payment Regime to be introduced for certain metrics (such as DSR) before other higher risk metrics where the Transition Period is needed to effectively offset that risk.

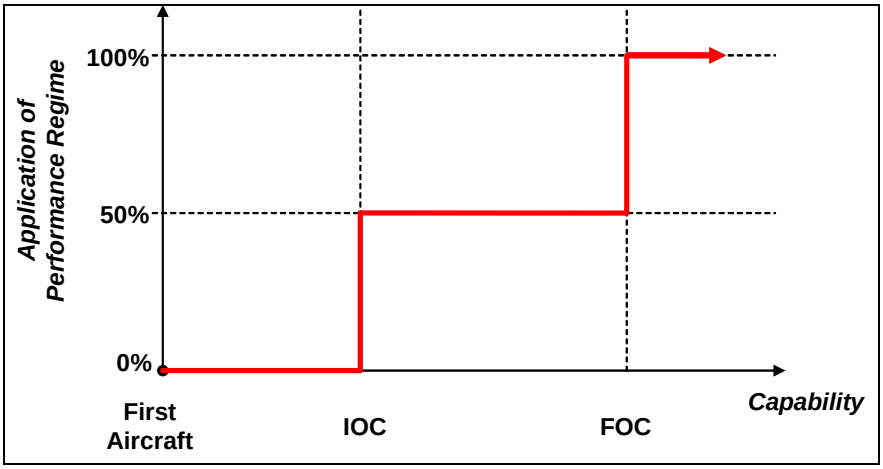


Figure 2-4-1: Application of Performance Regime during Transition Period

ASD TLS CONTRACT PAYMENT REGIME

As detailed below in Figure 2-4-2, the critical steps in establishing a Payment Regime for a TLS Contract are to set Performance Targets, assign Weightings and interpret results to determine the contractor's Performance Payment. These steps are discussed below for each of the Performance Metrics:

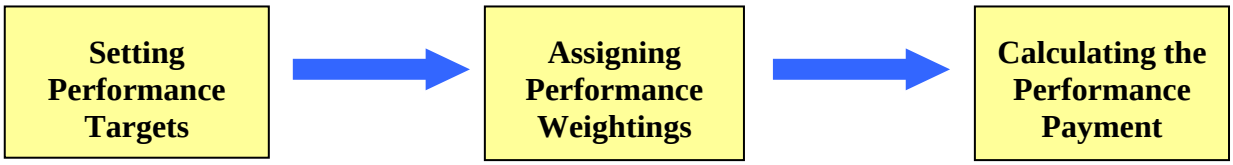


Figure 2-4-2: Steps in establishing a TLS Contract payment regime

Setting Performance Targets

Available Aircraft. The Performance Target (i.e. number and frequency of aircraft required per day) can be determined from the contracted Rate of Effort and Operational Concept Document. Aircraft status can then be automatically reported by NetMAARS against the Mission Critical Item List (MCIL). NetMAARS identifies and reports the serviceability status of all aircraft assets that meet the Fully Mission Capable (see Part 2, Chapter 2) requirement defined in the relevant MCIL. If an aircraft is not Fully Mission Capable (FMC), a further determination needs to be made by the Maintenance Coordinator that the aircraft is either Not Mission Capable (NMC), Partially Mission Capable (PMC) or FMC(C). PMC can either relate to a specific subset of the MCIL or cover any occasion when Defence chooses to use an aircraft which is less than FMC but has sufficient systems available to perform at least one mission. Payment should be graduated to reflect the functionality achieved by the contractor,

such that FMC/FMC(C) aircraft would attract 100% of the 'At Risk' margin applicable to the Metric, PMC nominally 70% (determined for each contract) and NMC, 0%.

Mission Reliability. The overall system Mission Reliability, as represented by the overall system Mean Time Between Critical Failure (MTBCF), is a combination of the various individual reliabilities of sub-systems, components, etc that can be calculated using a Mission Reliability Model of the system. A Mission Reliability Model is simply a hierarchical breakdown of the necessary sub-systems, components etc necessary for the successful operation of system based on the FMC MCIL (see Part 2, Chapter 3). The data necessary to support a Mission Reliability Model will be collected from the aircraft EE500/508s at the OM level, and EE435 or equivalent records at the DM level. This data will be entered into CAMM2, as part of the data source for the NetMAARS reporting tool, and the MTBCF will then be automatically calculated using a Mission Reliability Model of the system. The MTBCF will be calculated using the most recent 12 months of aircraft data from NetMAARS to ensure that there were statistically significant Airframe Hours (AFHRs) flown in the Review Period. While not difficult, the calculation and reporting of MTBCF can be complicated and it is recommended that projects seek advice from the ASD Reliability, Availability and Maintainability (RAM) Centre of Expertise (CoE), AS-BPS R&M, on Tel: (02) 6265 1508.

Demand Satisfaction Rate. The Performance Targets for DSR for both Repairable Items (RI) and Break Down Spares (BDS) should reflect the rates specified in the relevant Aerospace Materiel Sustainment Agreements. The rate should satisfactorily support the aircraft operations without requiring excessive and uneconomical reserve holdings.

Assign Performance Weightings

Weightings are then assigned to the Performance Metrics to reflect the importance Defence accords to their achievement. The weightings given to the ASD Through Life Support Performance Metrics are provided in Table 2-4-1.

Performance Metric	Weighting (%)
Available Aircraft (AA)	50
Mean Time Between Critical Failure (MTBCF)	30
Demand Satisfaction Rate (DSR)	20

Table 2-4-1: Weightings of ASD Aero Engine Performance Metrics

The Weightings are used to divide the At Risk margin into the payment available for each of the Performance Metrics.

Calculating the Performance Payment

There are three steps in calculating the Performance Payment:

STEP 1 - Calculate the average percentage Achieved Performance for each Performance Metric;

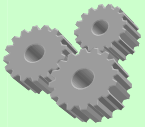
STEP 2 - Adjust the Achieved Performance to reflect Minor, Major or Unacceptable Performance; and

STEP 3 - Apply the Weightings to the Adjusted Performance in each of the Performance Metrics and sum these results to determine the Weighted Performance Score (WPS).

Adjusting performance results aligns to the philosophy that ASD is paying for the actual value represented by a contractor's performance. This value increases as it approaches the contracted level and becomes marginal when the contractor significantly underperforms. For example, if Available Aircraft is less than 50% of the contracted Target, Defence accrues significant opportunity costs for aircrew not actively participating in continuation training and therefore there is little to no value to Defence of this level of Service.

The easiest way to demonstrate the calculation of the Performance Payment is with a worked example.

Example Calculation of the Performance Payment



STEP 1 - CALCULATE ACHIEVED PERFORMANCE

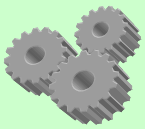
The following table reflects a scenario of results for a particular Review Period:

Performance Measure	Contracted Target	Contractor's Average Achieved Performance	Achieved Performance
Available Aircraft	10 FMC	8 FMC 2 PMC } ie 9.4	.94
MTBCF	61	45	.74
DSR	95%	95%	1

If we assume that a contractor achieves on average 8 FMC and 2 PMC per day over the Review Period, and that a PMC aircraft is valued at 0.7 of a FMC aircraft, then the contractor has achieved an average performance of 94% of the contracted requirement. Similarly, an average achieved MTBCF of 45 hours is 74% of the Performance Target. In the scenario, the contractor has met the contracted DSR.

Figures used in this example are for illustration purposed only and do not represent policy or guidance on the Performance Targets and/or reduced payment levels for Partially Mission Capable (PMC) Aircraft.

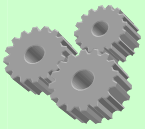
ASD Business Unit should be guided by the acceptable (to the final customer) variation of the Achieved Performance versus the value that level of Performance.



STEP 2 – CALCULATE ADJUSTED PERFORMANCE

The use of Performance Bands enables ASD Business Units to skew payment to increase rewards for performance as it reaches the Performance Target.

Using the scenario described above, the contractor would receive the full value of its performance for Available Aircraft as 94% falls in the Minor Variation Performance Band. Similarly, the contractor would receive 100% of the value of its performance for DSR. The Achieved Performance for MTBCF, however, falls within the Major Variation Performance Band (50 – 80%). Each 1% fall in Achieved Performance in this Band results in a 2.7% reduction in the Adjusted Performance Result for the Metric. Refer to annex A for further discussion and examples on the calculation of the fall of the individual fall rates. Achieved Performance for MTBCF in this case would therefore be downgraded to 64%.



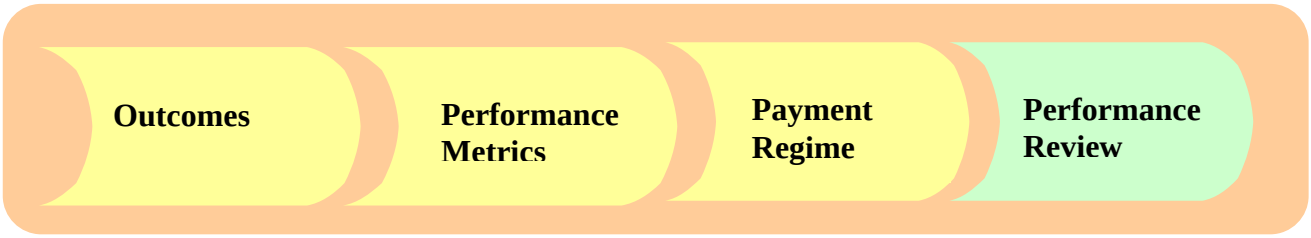
STEP 3 – CALCULATE PERFORMANCE PAYMENT

The Weighted Performance Score (WPS) is simply the sum of the Adjusted Performance results multiplied by the Weightings for each of the Performance Metrics, that is:

$$\text{WPS} = 0.94(0.5) + 0.64(0.3) + 1(0.2)$$
$$= 0.86$$

In this example, the contractor would be paid 86% of their ‘At Risk’ margin for the particular Review Period.

CHAPTER 5 - THROUGH LIFE SUPPORT CONTRACT PERFORMANCE REVIEW



ASD TLS PERFORMANCE REVIEWS

1. **Executive**
2. **Capability Management**
3. **Systems Health**

GUIDING PRINCIPLES

Performance Review is the capstone activity in the Performance Framework and ensures that the principles and objectives of the other activities are achieved.

There are three levels of Performance Review:

- **Executive**, which reviews the continued validity of the contract Outcomes, manages Total Cost of Ownership (TCO) and supports the contractual relationship between the parties;
- **Capability Management**, where the Performance Metrics (see Part 2, Chapter 3) are reviewed and payment determined; and
- **Systems Health**, which is the regular management review for SHIs (see Part 2, Chapter 3) and other line management concerns.

The pyramid of Performance Review in Figure 2-5-1 is intended to reflect the increasing frequency and tactical nature of discussions, from the Executive Review level through the Capability Management Review level to the Systems Health Review level.

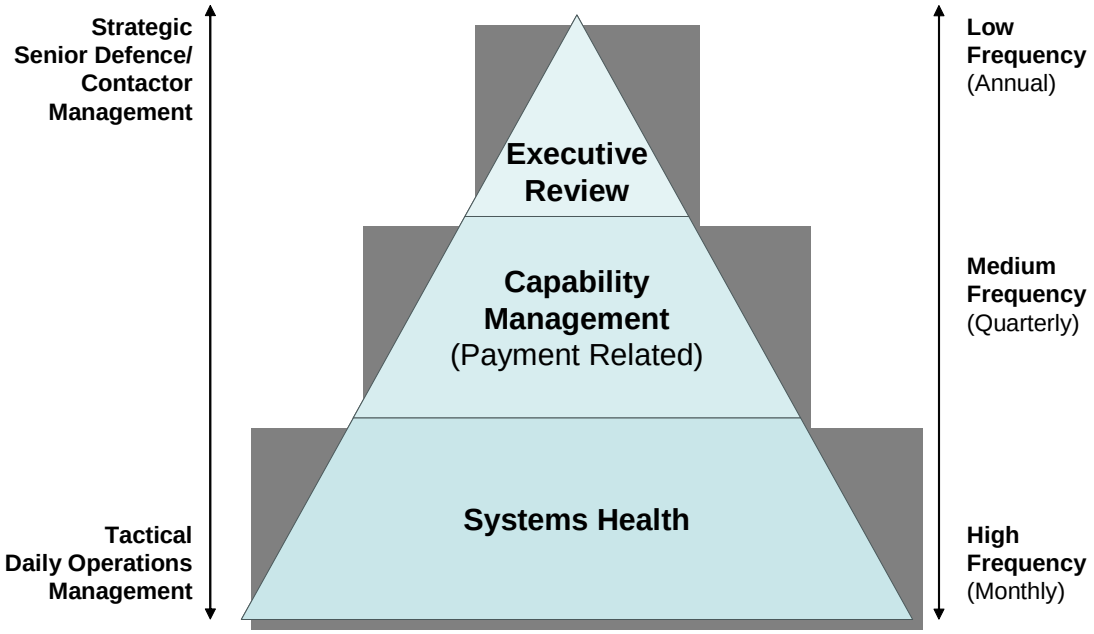


Figure 2-5-1: Hierarchy of ASD TLS Performance Reviews

ASD TLS PERFORMANCE REVIEWS

Executive Review

The Performance Framework recognises that an effective contract is highly reliant on the contractual relationship. The Executive Review provides an opportunity to appraise the contract's effectiveness in terms of both Defence's Capability Outcomes and the contractor's legitimate commercial expectations.

Accordingly, the objectives of the Executive Review are to manage:

- shared values and principles for engendering trust;
- changes in strategic priorities and their effect on contract Outcomes,
- Whole of Life issues, including total cost of ownership, and
- Review of annual incentive arrangement include setting, monitoring and reviewing. incentive goals.

Executive Reviews can also be used to assess progress and agree payment of any Incentive Program (see Part2, Chapter 6).

Where appropriate, the Review can be used to re-baseline or 'ratchet' the existing contract to a new level of service which then becomes the standard for measuring contractor performance.

The expectation is that the Executive Review would be conducted at least annually during the program and would normally involve senior Defence and contractor management.

Capability Management Review

The Capability Management Review is the culmination of the Performance Metric and Payment Regime activities.

The Reviews are intended to discuss each Performance Metric and agree payment based on contractor performance. The concentration on Performance Metrics provides an opportunity to discuss contractor performance as it contributes to the Weapon System as a Defence Capability.

The Capability Management Reviews are expected to be held quarterly and involve middle management from both the contractor and Defence.

Prior to the Capability Management Reviews a Reliability Review Board (RRB) should be held IAW the RRB Charter in order for both the Commonwealth and contractor to sentence failures and therefore determine the system MTBCF.

Systems Health Review

The System Health Review provides a regular opportunity to discuss critical process issues affecting system performance.

Accordingly, SHIs would be discussed at these Reviews, as well as progress reports on Performance Metrics. The latter ensures that discrepancies in Performance Metric results are addressed continuously, to ensure that exceptions can be resolved prior to Capability Management Reviews.

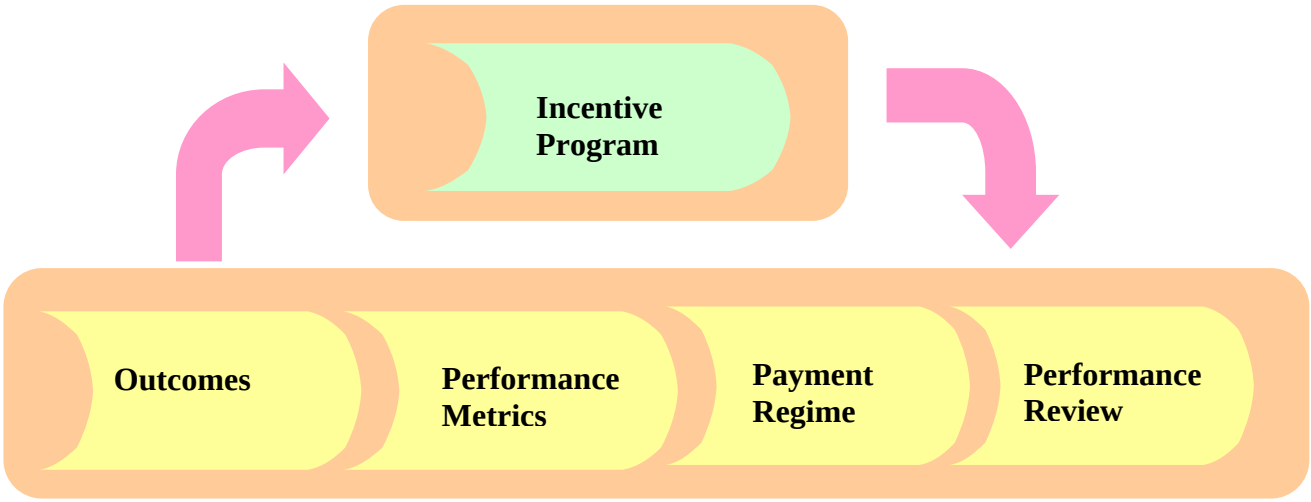
Systems Health Reviews are expected to be conducted monthly, with line management participation.

Daily Performance Metric Scoring

In addition to the three ASD PBC TLS Performance Reviews there will be a need for a daily review (scoring) of the Achieved Available Aircraft either in terms of FMC, FMC(C), PMC or NMC or a satisfaction of a Daily Flying Program.

Scoring should be IAW the Available Aircraft scoring process detailed in Part 2, Chapter 3, Annex A.

CHAPTER 6 - THROUGH LIFE SUPPORT CONTRACT INCENTIVE REGIME



As discussed in Chapter 8 of Part 1, ASD may offer financial and non-financial incentives for additional contract Outcomes.

PART 3 - CONTRACTED MAINTENANCE SUPPORT CONTRACTS

CHAPTER 1 - GETTING STARTED – CONTRACTED MAINTENANCE SUPPORT CONTRACTS

INTRODUCTION

Part 2 of the ASD PBC Handbook describes the application of the general PBC principles to the Through Life Support (TLS) contracting scenario. Part 3 tailors these general PBC principles to the Contracted Maintenance (CM) Support contracting scenario.

DEFINITION

CM is described as those maintenance services not required to be organic to the relevant Service (i.e. Navy, Army or Air Force) or ASD Business Unit. Organic Maintenance[21] are those services essential to direct operational support and/or required to be undertaken in the Area of Operations (AO). CM Support contracts normally include performance of maintenance, CM supply support and associated engineering services, and is likely to include AMO and AEO responsibilities. However, CM Support contracts can vary in scope from relatively simple, short duration activities, such as aircraft wash, to more complex modification incorporation or Deeper Maintenance servicings.

PERFORMANCE BASED CONTRACTING

Figure 3-1-1 below illustrates the core PBC framework that will be used to develop a PBC approach for CM Support contracts:

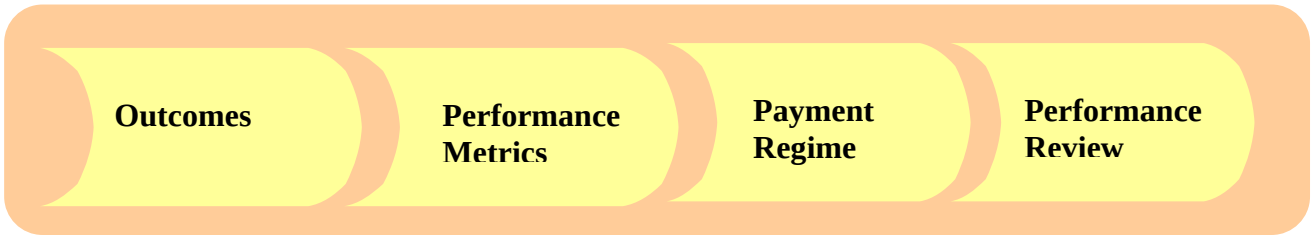


Figure 3-1-1: CM Support Contracts Performance Framework Schematic

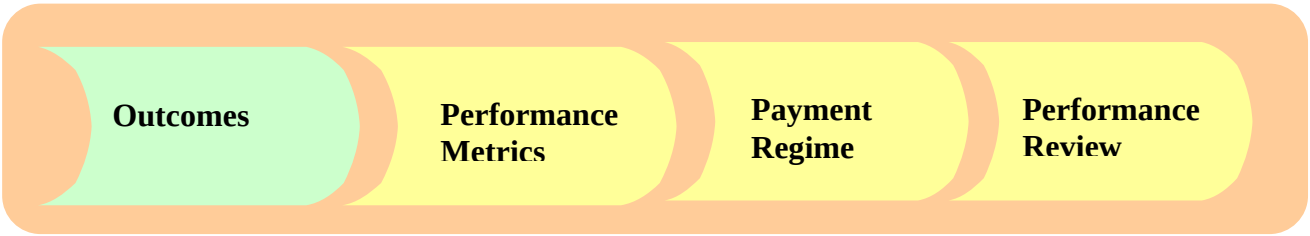
[21] Defined in AAP 1004 Air Force Logistics Support Concept

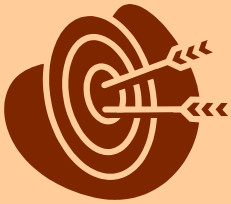
STAND ALONE MODIFICATION PROGRAMS

There may be times when a contractor will be engaged to incorporate a modification program(s) to an aircraft separately to the scheduled maintenance activities and possibly by an independent contractor.

While the Contracted Maintenance framework provided in Part 3 of the ASD PBC Handbook is intended to apply to continuous maintenance activities such as scheduled maintenance activities (e.g. Deeper Maintenance), the Contracted Maintenance Framework can equally apply to individual and fleet wide aircraft modification program(s).

CHAPTER 2 - CONTRACTED MAINTENANCE SUPPORT CONTRACT OUTCOMES





ASD CM SUPPORT CONTRACT OUTCOMES

1. **Available for Defence purposes**
2. **Quality of Workmanship**
3. **Quality of Engineering Services**

Chapter 4 of Part 1 described how technical equipment performance could be represented by the Reliability Engineering characteristics of Availability, Reliability, Maintainability[22] and Supportability. These characteristics facilitate the identification of key outcomes for any contracting scenario. However, in determining the appropriate Outcomes for Contracted Maintenance (CM) Support, consideration should be given to the contribution these services make to the achievement of strategic, platform (i.e. Through Life Support (TLS)) level objectives. Thus, Figure 3-2-1 below describes how the CM Support Outcomes can be validated by their contribution to TLS objectives.

SAFETY

While the focus of the ASD PBC Handbook is primarily on performance management, it does not reduce or negate the contractor's responsibilities to produce and maintain materiel to a specified level of safety as either as an Authorised Engineering Organisation (AEO) or as an Authorised Maintenance Organisation (AMO).

[22] Maintainability is considered a characteristic which is largely determined during the Acquisition phase of a Weapon System and is therefore not considered a useful basis for a Performance Metric in the Sustainment phase.

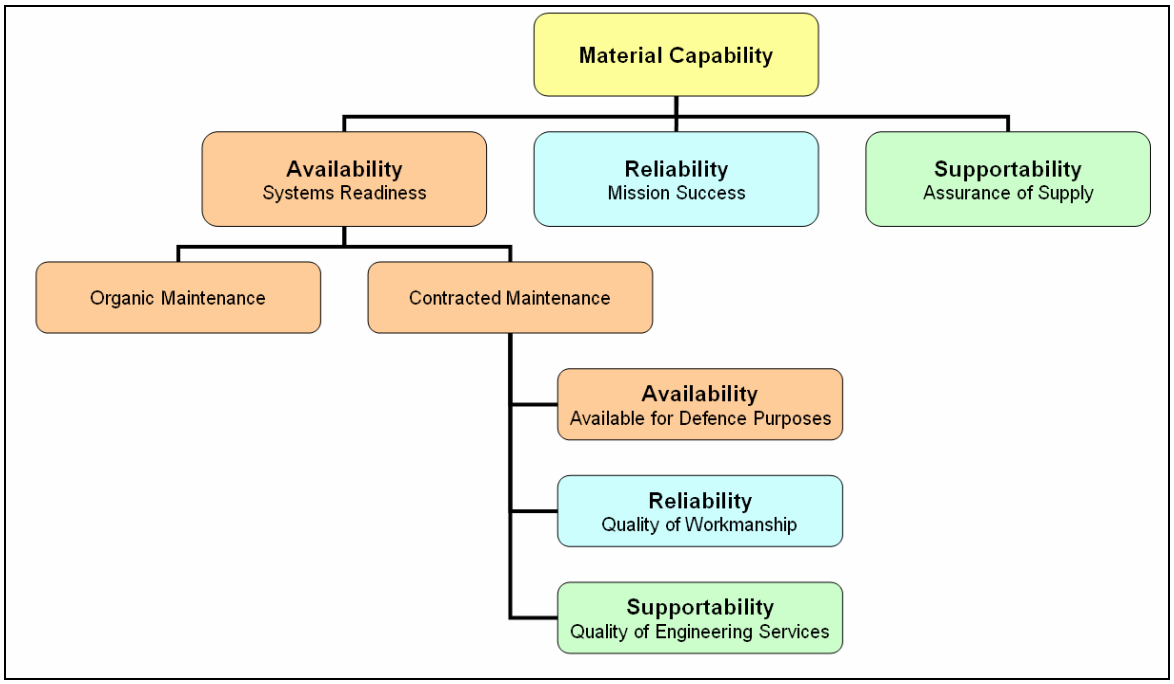


Figure 3-2-1: The contribution of CM Support Outcomes to TLS Outcomes

Availability

In a CM Support contract, the maintenance provider may have limited responsibility for the overall design or performance at the system level. Instead, responsibility is confined to performing a defined service within a known and agreed timeframe. Accordingly, availability is not likened to *serviceability* as in Part 2 but is more accurately described as *available for Defence purposes*. This Outcome captures the aircraft state of being released from CM and therefore contractor control, but may not result in the delivery of a serviceable aircraft. Indeed, Defence purposes may require further Organic or other independent CM.

Reliability

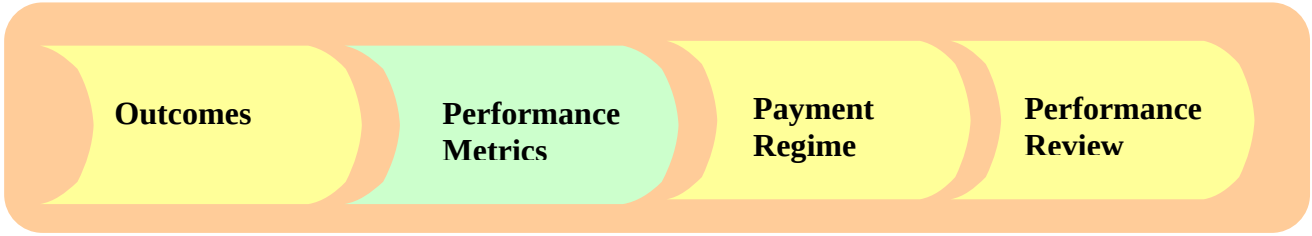
While availability reflects the timeliness of the service and reflects the efficiency of the maintenance operation, the CM Support service must also be effective and dependable; that is, reliable. Moreover, preoccupation with availability to the exclusion of reliability, may compromise reliability as expediency is valued over a quality service. Accordingly, *quality of workmanship* is a key Outcome in a Contracted Maintenance service. *Quality of workmanship* is reflected in the Defence Acceptance process immediately following CM. However, certain workmanship issues may not be immediately apparent and longer term quality controls may also be warranted.

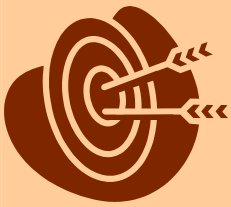
Supportability

Supportability concerns the ability of the contracted services to be assured or sustained over time. In the CM Support contracting scenario, this sustainability of service may be described as the *quality of engineering services*. Given the variation in scope and ancillary services in CM Support contracts, including independent modification programs, this Outcome should be

tailored to the individual contracting scenario. Indeed, where there is significant variation in services and priorities, a range of Systems Health Indicators may be preferable to any single Performance Metric.

CHAPTER 3 - CONTRACTED MAINTENANCE SUPPORT CONTRACT PERFORMANCE METRICS





ASD CM PERFORMANCE METRICS

1. **Contracted Maintenance Turnaround Time (TAT)**
2. **Total Number of Rectifications from Acceptance process**
3. **Quality of Engineering Services Metric(s)**

The second step in developing a PBC model is to identify Performance Metrics which give best information about the Outcomes. In the Contracted Maintenance contracting scenario, the following Metrics have been chosen:

Available for Defence Purposes

The Metric chosen for this Outcome is *Contracted Maintenance Turnaround Time (TAT)*. The key to this Metric is to include agreed TATs for known servicings and/or modification programs into the contract baseline. TAT is measured from handover to the maintenance program to Acceptance by Defence and is compared to the contract benchmark. The Acceptance by Defence will include completion and receipt of any necessary paperwork. Where Acceptance requires lengthy examination or Defence Flight Testing, time is suspended while these activities are conducted. In practice, the target for a Contracted Maintenance service TAT will be developed and agreed to prior to inducting an individual aircraft and is likely to be informed by the Defence Condition Report.

Quality of Workmanship

While quality of workmanship is a high value Outcome, in practice it may be difficult to measure. Immediate workmanship issues may be adequately measured as the *total number of Rectifications identified during the Defence Acceptance process*. It may also be useful to consider the accuracy of the accompanying data pack and support to test flight planning as elements of a quality Contracted Maintenance service.

Alternate Quality of Workmanship

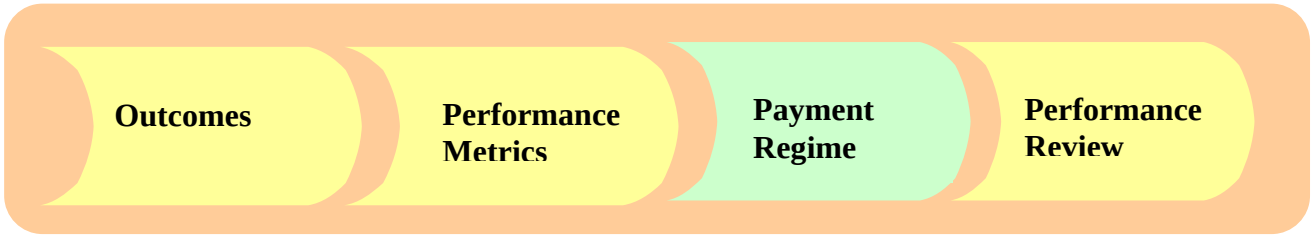
An alternative or addition to the Total Number of Rectifications is the Total Number of Test Flights. Where a Test Flight is part of the Defence Acceptance process it may be ideal to include the number of test flights required for Defence to "Accept" the aircraft as a Performance Measure as this represents the impost on the Defence organic maintenance staff.

Quality of Engineering Services

Given the variation in scope and ancillary services in Contracted Maintenance contracts, this Outcome should be tailored to the individual contracting scenario. Indeed, where there is significant variation in services and priorities, a range of Systems Health Indicators may be preferable to any single Performance Metric. However, any Metric selected must measure the ability of the contracted services to be assured or sustained over time.

If the Contracted Maintenance contractor has AEO responsibilities, an option for this Metric is to measure the *Outstanding Logistics Processes* at the strategic level. Outstanding Logistics Processes is currently being using to measure ASD SPO performance (refer to ASD KPI 2.1.4). Alternatively, *Outstanding Corrective Action Reports (CARs)* is arguably a useful Metric in measuring the long term viability of the AEO/AMO status and may therefore be considered an adequate measure of the quality of engineering services. Alternatively, operational level metrics such as *TAT for Publication Amendments* could be chosen when technical data is considered a critical and high risk enabler of Contracted Maintenance services.

CHAPTER 4 - CONTRACTED MAINTENANCE SUPPORT CONTRACT PAYMENT REGIME



ASD CM SUPPORT WEIGHTINGS

1. **60% for Contracted Maintenance Turn-Around Time (CM TAT)**
2. **30% for Total Number of Rectifications from Acceptance process**
3. **10% for Quality of Engineering Services Metric(s)**

The third step in developing a Performance Based Contracting (PBC) model for Contracted Maintenance (CM) Support contracts is to prepare an appropriate performance payment approach.

CM SUPPORT TRANSITION PERIOD

The ASD PBC framework for CM Support activities does not envisage the introduction of the performance Payment Regime until a baseline for performance has been established. This would normally occur no later than 12 months from Acceptance but more importantly should be tied to a realistic milestone to ensure that it does not delay the introduction indefinitely. However, in the case of existing (legacy) CM Support contracts migrating to a PBC Framework, the Transition Period should be very short (i.e. less than 3 months), if any, to ensure the continued delivery of services to ASD and in turn the Services (i.e. Navy, Army and Air Force). Benefits from a Transition Period include the opportunity to bed-in support systems and reporting mechanisms, and avoid initial and unrepresentative performance discrepancies. Importantly, performance measures and target levels are agreed and set at contract signature, prior to the transition period—transition periods are not to be used to vary pre-agreed performance measures and target levels.

One possible model for scheduling a Transition Period is provided below in Figure 3-4-1. ASD Business Units are encouraged to negotiate a Transition Period which logically suits their particular delivery schedule, addressing the amount of the Monthly Service Fee, At Risk amount and any Incentive program which would apply at each stage. It may also be

appropriate for the performance Payment Regime to be introduced for certain metrics before other higher risk metrics where the Transition Period is needed to effectively offset that risk.

The Transition Period should not be viewed as a research phase for selection of appropriate Metrics or achievable Targets. The Metrics and Targets should be agreed prior to contract signature and the Transition Period is merely a validation of the accuracy and significance of the data, given possible transition problems.

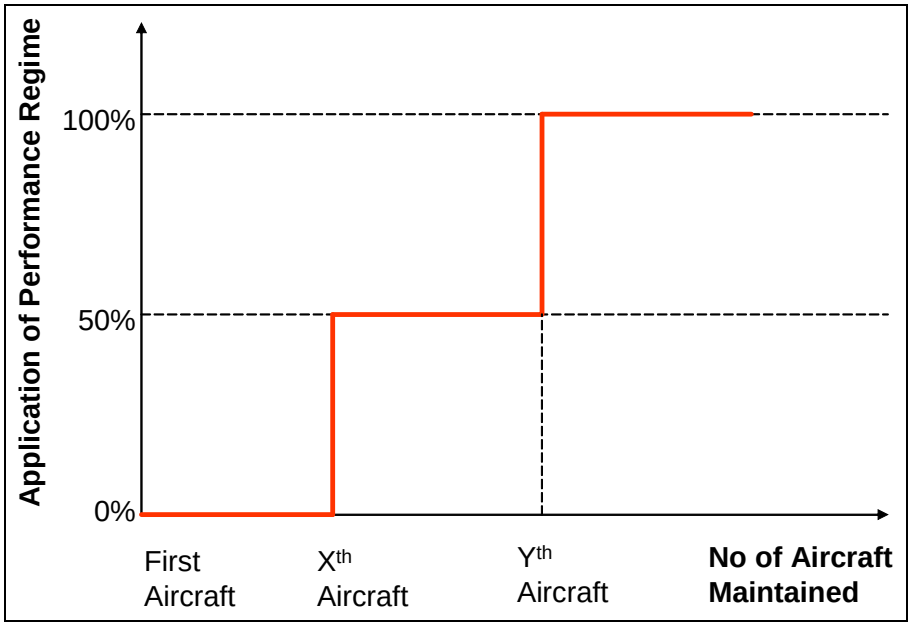


Figure 3-4-1: Application of Performance Regime during Transition Period

CM SUPPORT PAYMENT REGIME

As previously described in Chapter 7 of Part 1, there are 3 steps in developing a PBC payment model for CM Support contracts. These are:

STEP 1 - Determine contractor performance,

STEP 2 Adjust for value represented by performance, and

STEP 3 Weight the adjusted performance results.

Determine Contractor Performance

The data sources for the ASD CM Support Performance Metrics are provided in Table 3-4-1.

Performance Metric	Data Source
Contracted Maintenance Turn-Around Time (CM TAT)	Fleet Doctor or equivalent
Total Number of Rectifications from Acceptance process	Local system
Total Number of Defence Test Flights prior to Defence Acceptance	*Local system*
Outstanding Logistics Processes	EMERALD or equivalent

Table 3-4-1: Data Sources for the ASD Contracted Maintenance Performance Metrics

Low Rate Initial Production (LRIP) to get Values of Performance.

Where a new modification package is to be incorporated it may be possible to allow the contractor to measure CM Turn-Around Time (CM TAT) during the LRIP phase, possibly equal to the Transition Period, to determine the contract CM TAT baseline. However, where this approach is used the SPO to ensure that any variation is minimised:

1. *the predicted CM TAT is reviewed by the SPO, and*
2. *the final Contract CM TAT baseline is cognisant of any "learning" which should decrease the CM TAT over time.*

Adjust for Value Represented by Performance

Figure 3-4-2 below shows how performance should be adjusted to better reflect the value ASD considers is represented by contractor performance:

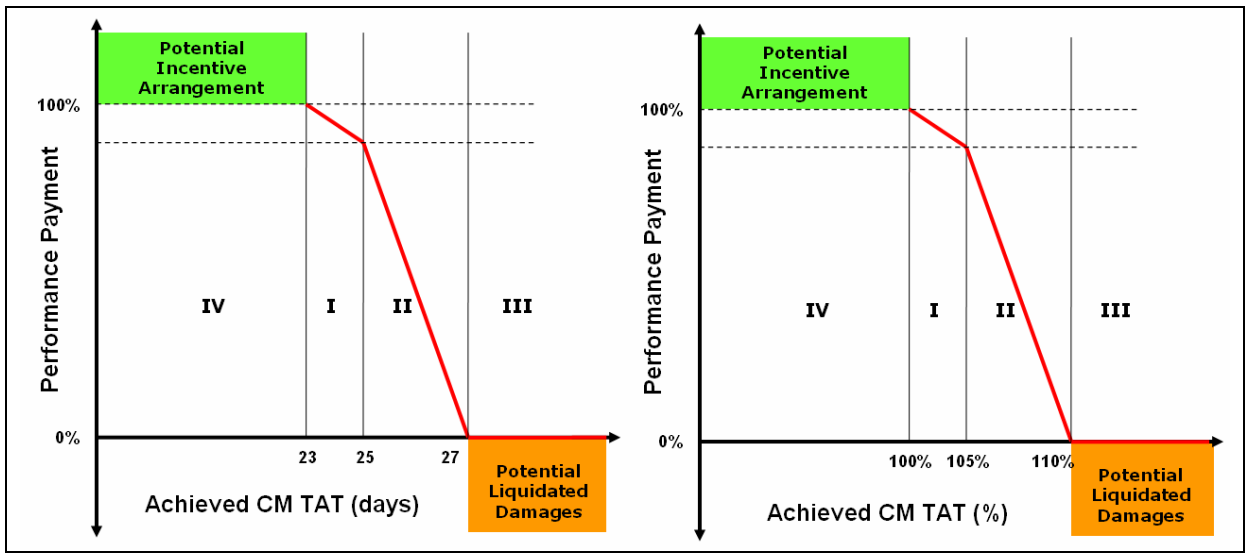


Figure 3-4-2: ASD CM TAT Performance Payment Graph

For each CM Support contract, the ASD Business Unit needs to determine the conditions for Performance Bands I, II, III and IV. Performance Band I shows the range of acceptable performance variation from the contracted baseline (i.e. 100%) to a point of minor variation below this level. The performance payment in this range also needs to be determined and agreed. Performance Band II is a range which represents major variation and payment would fall more rapidly in relation to performance in this Band to deter continued underperformance. When performance falls to an unacceptable level, shown by Performance Band III, Liquidated Damages may be initiated. The final decision for the ASD Business Unit is whether performance above the contracted baseline would be valued by Defence. Although exceeding the performance baseline may be representative of continuous improvement (such as continuous rectification free acceptance from CM), care should be taken that the additional capability can be used. For example, early return from a CM service may not be desirable in all circumstances (see Part 3, Chapter 6 on CM Support Incentives).

The selection of acceptable performance should be developed and flow down from the Materiel Agency Agreements (MAAs) for new acquisitions or Materiel Sustainment Agreements (MSAs) for legacy sustainment activities.

It should be noted where there is variation in the CM TAT baseline due to varying factors (e.g. aircraft status as indicated in the Defence Condition Report) it is possible to modify the payment curves illustrated in Figure 3-4-2. This modification will reduce the administrative burden to both the contractor and Defence Contract Managers. Specifically, there are 2 methods depending on the acceptable size of the deviation in CM TAT as follows:

Option 1 – Specify the deviation in days. *Where the total CM TAT is low (< 30 days), the Payment Curve should reflect a variation in terms of days.*

Option 2 – Specify the deviation in Percentage TAT. *Where the total CM TAT is high (> 60 days), the Payment Curve should reflect a variation in terms of a percentage deviation from the Contracted CM TAT baseline.*

This is shown in Figure 3-4-2. Alternatively, a combination of both could be used.

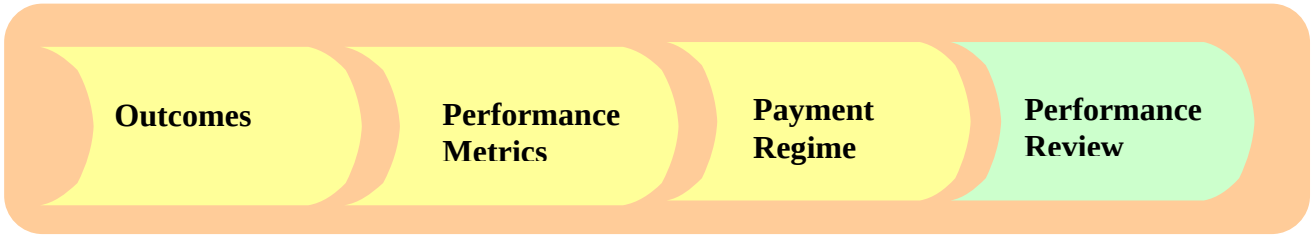
Weight the Adjusted Performance Results

The weightings given to the ASD CM Support contract Performance Metrics are provided in Table 3-4-2.

Performance Metric	Weighting (%)
CM TAT	60
Total Number of Rectifications from Acceptance process	30
Outstanding Logistics Processes	10

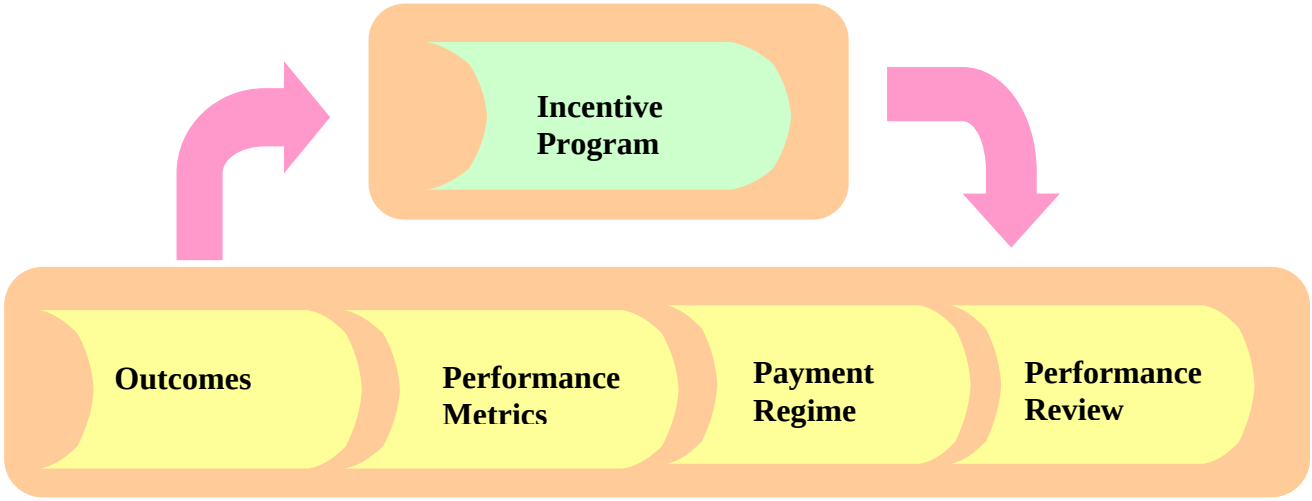
Table 3-4-2: Weightings for ASD CM Support Performance Metrics

CHAPTER 5 - CONTRACTED MAINTENANCE SUPPORT CONTRACT PERFORMANCE REVIEW



There are likely to be two Review points for the Contracted Maintenance PBC model. The first is the pre-induction meeting. Contracted TATs will be referenced during this meeting as well as any adjustments driven by modifications, on-condition or Survey & Quote work scope. The second meeting would be to determine performance payment. This meeting would be used to validate contractor actual performance prior to adjustment and calculation of the Weighted Performance Score (WPS). Part of the validation would be to exclude Rectifications deemed ‘unchargeable’. The final timing, frequency and composition of the reviews should be determined by the individual ASD Business Unit.

CHAPTER 6 - CONTRACTED MAINTENANCE SUPPORT CONTRACT INCENTIVE REGIME



As discussed in Chapter 8 of Part 1, ASD may offer financial and non-financial incentives for additional Outcomes from a Contracted Maintenance (CM) Support contract. Three possible Outcomes for CM Support contract Incentive Programs are outlined below.

Option 1 – Increasing Aircraft Availability

Figure 3-6-1 describes three scenarios of aircraft availability from CM. Scenario 1 reflects the contracted TAT for a particular CM event. Scenario 2 shows early delivery aircraft out of CM which may not represent value for Defence as earlier-than-planned re-lifing of components could create difficulties for future maintenance planning. However, where the contractor believes that they can achieve shorter TATs, they may be given an Incentive to accept late induction of aircraft. This scenario is shown as Scenario 3. Incentives for late induction should be considered against the ASD operational environment to ensure that the additional time available for 'Defence purposes' represents value for money.

The incentive for late induction should only be available to the contractor for a fixed duration between re-baselining activities approximately every 3 – 5 years. At the next re-baselining point, the contracted TAT level would be amended to reflect the historical average of TAT and incentives offered for late induction against this new contracted level. For example, consider the situation where a contractor was contracted for TAT of 100 days with incentives offered for late induction (meaning a reduced TAT). During the initial contracting period (prior to an agreed re-baseline point) the historical average TAT of 90 days was achieved by the contractor, meaning that Defence paid the agreed incentives for all occurrences during this period. At the re-baseline point the contracted TAT level would be set to 90 days and incentives offered for late induction based on an achieved TAT level below the new TAT (e.g. less than 90 days).

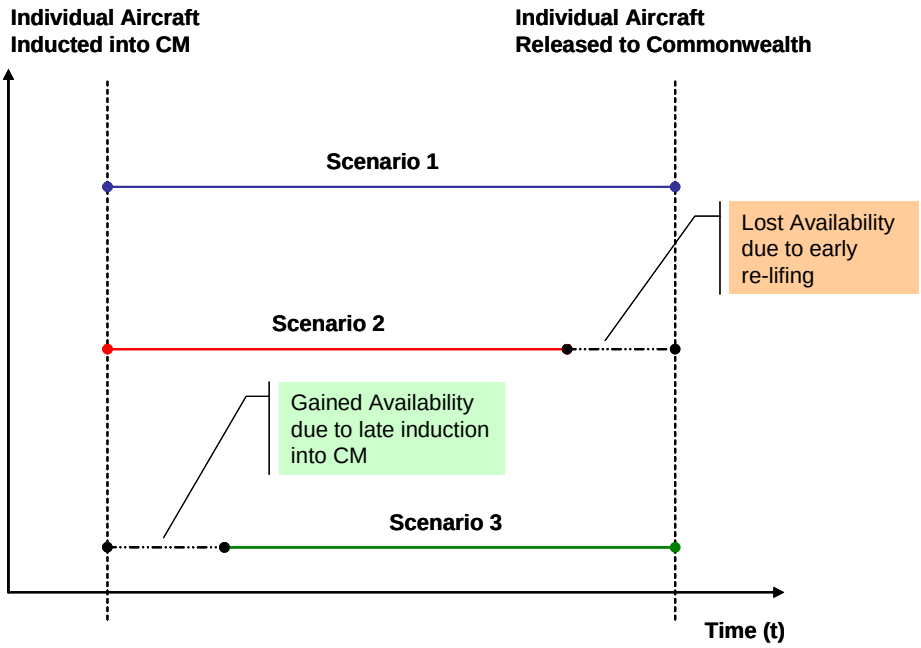


Figure 3-6-1: Contracted Maintenance Incentive Scenario – Option 1

Option 2 – Reducing Financial and Schedule Risk

On-condition maintenance discovered during CM inspections and/or Task Priced Services can create schedule and financial risk for ASD. Accordingly, the contractor could be incentivised to reduce the additional scope added at the pre-induction meeting by continuously learning and revising the scope of scheduled servicings.

Option 3 – Carried Forward Unserviceability (CFU) Reduction

Scheduled maintenance or a standalone modification program may not include the rectification of Carried Forward Unserviceabilities (CFUs) on individual aircraft. However, CFU impact organic maintenance through the additional workload required to clear these items. Accordingly, the contractor could be provided with an incentive to reduce the number of CFUs per aircraft during the CM activity. Here the Performance Measure is the percentage of CFUs cleared by the contractor during the CM activity with a commensurate increase in the Contracted CM TAT baseline.

PART 4 - REPAIRABLE ITEM SUPPORT CONTRACTS

CHAPTER 1 - GETTING STARTED – REPAIRABLE ITEM SUPPORT CONTRACTS

INTRODUCTION

Part 1 of the ASD PBC Handbook described the general process for developing and implementing a PBC Framework. Parts 2 and 3 of the ASD PBC Handbook concern Through Life Support (TLS) and Contracted Maintenance (CM) Support contracts respectively. This Part considers the application of the PBC framework to the Repairable Item (RI) contracting scenario.

DEFINITION

Repairable Items are defined as items of equipment which can be restored to perform all of their required functions by corrective maintenance.[23] Contracts for RIs normally involve their supply, storage, transportation, and repair and may involve engineering services (eg Configuration, Obsolescence or design management).

PERFORMANCE BASED CONTRACTING

Figure 4-1-1 is the core PBC framework which will be used to develop a PBC approach for Repairable Item contracts:

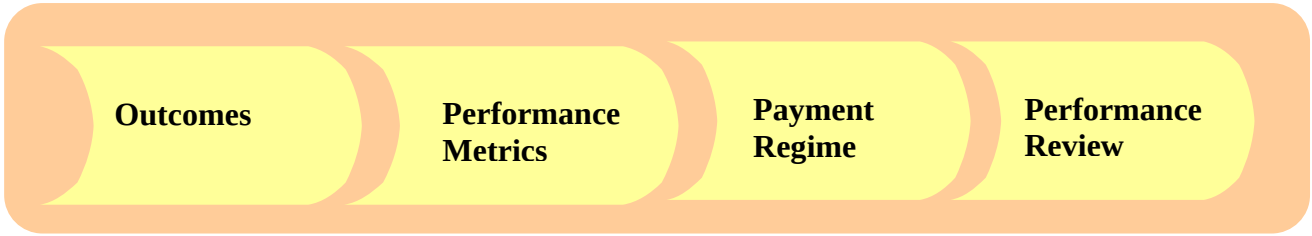
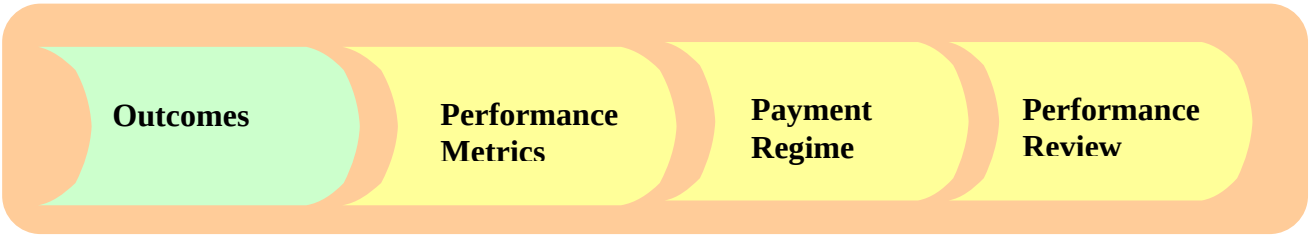
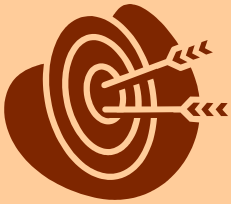


Figure 4-1-1: RI Support Contracts Performance Framework Schematic

[23] LOGMAN AL3, DOD-HDBK-791(AM) 17 Mar 88

CHAPTER 2 - REPAIRABLE ITEM SUPPORT CONTRACT OUTCOMES





ASD RI CONTRACT OUTCOMES

1. **Available for Operation**
2. **Minimised impact on Operations**
3. **Sustainability of Supply**

Chapter 4 of Part 1 described how technical equipment performance could be represented by the Reliability Engineering characteristics of Availability, Reliability, Maintainability[24] and Supportability. These characteristics facilitate the identification of key outcomes for any contracting scenario. However, in determining the appropriate Outcomes for a Repairable Item (RI) Support contract, consideration should be given to the contribution these services make to the achievement of strategic, platform (i.e. Through Life Support (TLS)) level objectives. Thus, Figure 4-2-1 describes how the RI Support contract Outcomes are validated by their contribution to TLS objectives.

SAFETY

While the focus of the ASD PBC Handbook is primarily on performance management, it does not reduce or negate the responsibilities of the contractor to produce and maintain materiel to a specified level of safety as either as an Authorised Engineering Organisation (AEO) or as an Authorised Maintenance Organisation (AMO).

[24] Maintainability is considered a characteristic which is largely determined during the Acquisition phase of a Weapon System and is therefore not considered a useful basis for a Performance Metric in the Sustainment phase.

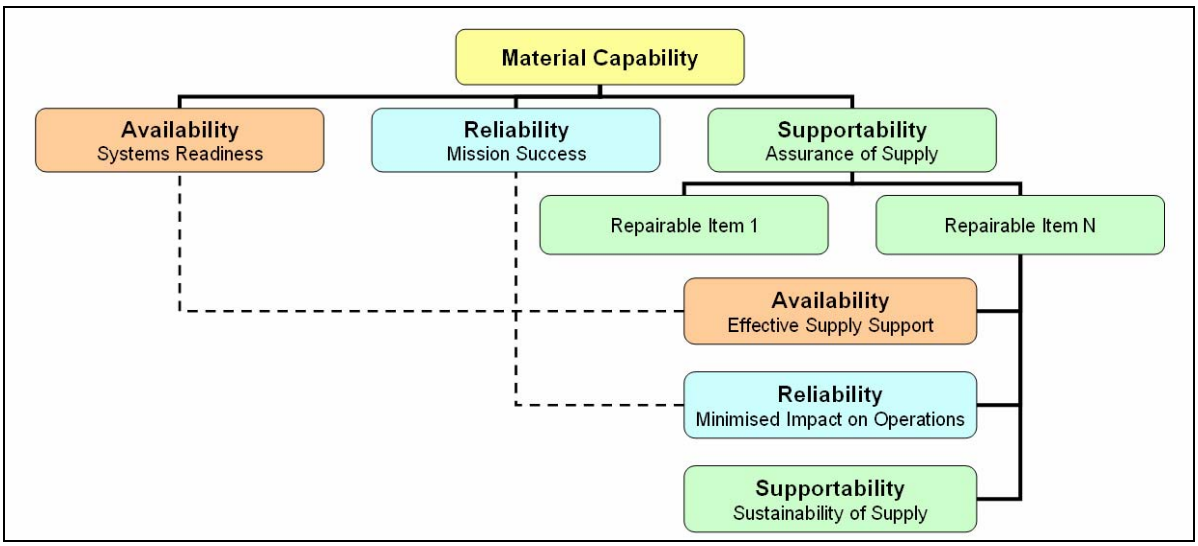


Figure 4-2-1: The contribution of RI Support Outcomes to TLS Outcomes

Availability

While the availability of a spare RI will ultimately effect platform availability, it is more likely that the Availability in the context of a single RI can be measured as *Effective Supply Support*. This Outcome captures the importance of Repairable Item availability in meeting operational demands which, in sum, achieves the Assurance of Supply Outcome.

Reliability

Reliability of an individual RI has limited value to Defence and should, instead, represent the impact the RI reliability has on overall system performance. Accordingly, the Outcome for RI reliability is to *Minimise Impact on Operations* either through corrective or preventative maintenance.

Supportability

Supportability of an RI is a product of the *Sustainability of its Supply*. As availability measures immediate satisfaction of requirements, sustainability is about ensuring that the supply support system continues to meet these requirements over an extended duration.

Repairable Item Manager (RIM)/Spares Inventory Manager (SIM) Functions

To deliver these outcomes to Defence, it is expected that any Repairable Item (RI) contractor undertake RI management include the typical System Project Office (SPO) functions of the Repairable Item Manager (RIM) and/or Spares Inventory Manager (SIM).

Additionally, depending on the scope of the contractor, then RI management may include Engineering Management activities.

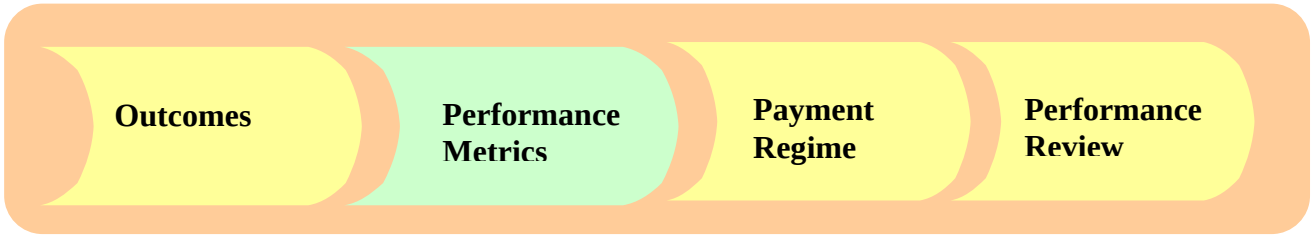
Obsolescence Management.

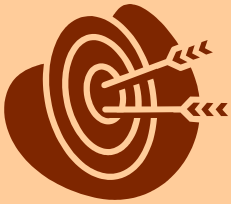
It is widely recognised that obsolescence is one of the primary drivers of increased sustainment costs as aircraft age[25]. While the effective management of obsolescence should result in cost containment, obsolescence management may not be possible where the Repairable Item (RI) contractor does not have sufficient scope within the contract to modify the RI in order to limit the effect in obsolescence. Specifically, the obsolescence of the RI may be the responsibility of the aircraft Original Equipment Manufacturer (OEM) or prime rather than the RI contractor.

Regardless, there is the expectation that the RI contractor will at the very least proactively monitor and report obsolescence issues. In the event that an RI under the control of the RI contractor is identified as becoming obsolete, it is ASD expectation that the RI contractor will notify ASD and offer an option (s) for the future.

[25] Draft ASD Ageing Aircraft Cost Provision Guidelines, July 2006

CHAPTER 3 - REPAIRABLE ITEM SUPPORT CONTRACT PERFORMANCE METRICS





ASD RI PERFORMANCE METRICS

1. **Effective Supply Support**
2. **MTBA**
3. **Sustainability of Supply Metric(s)**

The second step in developing a PBC model is to identify Performance Metrics which give best information about the Outcomes. In the Repairable Item (RI) Support contracting scenario these Metrics the following metrics have been chosen.

Effective Supply Support

The Performance Metric which best informs the Effective Supply Support Outcome is RI Demand Satisfaction Rate (DSR). This Metric is defined as the percentage of successful delivery of Repairable Item(s) demands against contracted response times, and reflects the effectiveness and efficiency of the Supply Support Solution. This Performance Metric has already been described in Chapter 3 of Part 2.

Minimum Asset Level (MAL)

It is widely recognised that Demand Satisfaction Rate (DSR) provides the contractor with the ability to provide an innovative solution to Defence's requirement by only specifying the need. However, there are times when the use of a DSR is problematic, mainly where there is insufficient demands to allow the use of percentage. Consider a DSR calculated monthly with a 90% Contracted Level of DSR with 2 demands per month. In this example a single failed delivery (e.g. 1 of 2) results in a DSR of 50% which may result in a significant impact on the At Risk Margin; possibly Liquidated Damages (LDs). Clearly with such low demand rates in the reporting the DSR performance may be too sensitive.

One alternative is the use of a Minimum Asset Level (MAL). MAL allows ASD to specify a number of Serviceable assets of a specified configuration to be made available at a prescribed location. As an item is taken, the RI contractor must make another available to satisfy the MAL.

While the use of MAL is acceptable, the specification of a minimum number of assets rather than the demand rate reduces the contractors responsibility and therefore incentive to innovate the supply support solution.

Minimised Impact on Operations

The Performance Metric used to measure the contractor management of RIs to minimise the impact on operations is *Mean Time Between Arisings (MTBA)*. MTBA is defined as mean operating time, normally expressed in hours, expected to be achieved, or achieved with an item before either fault rectification (i.e. corrective) or scheduled maintenance. The MTBA may include a number of in-situ fault rectifications or adjustments[26] and can include Nil Fault Found (NFF). Thus, MTBA is a true measure of the effect of RI reliability (represented by

[26] ADFP 101, AL1, 21 Oct 97

maintenance interventions) which makes it a better measure of its impact on operations than MTBF. Therefore, this Performance Metric, MTBA, takes into account the potential for RI maintenance, scheduled or unscheduled, to interrupt normal operations.

In the Case where the RI contractor is not the Platform prime or Original Equipment Manufacturer (OEM), there may be a number of demands (arisings) that cannot be directly attributable to the RI contractor. An example is demands resulting from platform level (i.e. aircraft) Built In Test (BIT) false positive. In this case an aircraft BIT will falsely report that an RI has failed, but when the RI contractor undertakes maintenance, there is NFF. In these circumstances, while ASD will not hold the RI contractor accountable for items outside their control, it is the ASD expectation that the RI contractor will proactively monitor and report changes in MTBA such as NFF for ASD action (i.e. warranty).

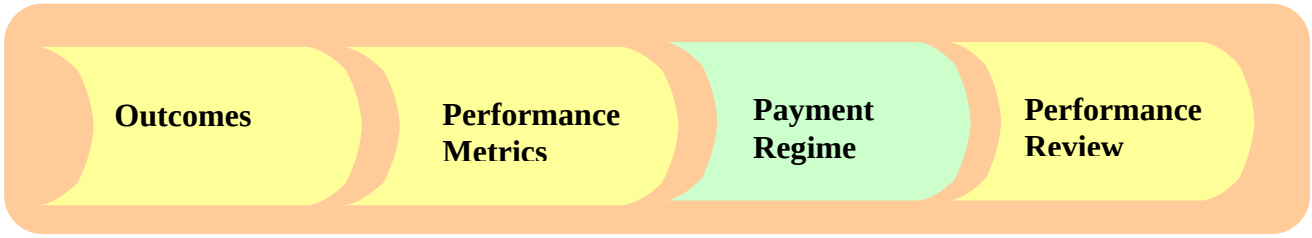
Sustainability of Supply Metric(s)

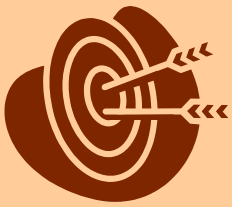
Sustainability of Supply can be measured by a number of lead supply support metrics. These include:

- *Accuracy of Demand Forecasting* (see Annex D to Chapter 3 of Part 2).
- *Contingency Equipment List Holdings* (a measure of on hand serviceable stock against a prescribed Contingency Equipment List) where an item is considered critical (for example, it may be listed on the aircraft Mission Critical Item List), can give Defence a level of confidence in meeting future demands.

Additionally, there may be alternative Performance Metrics based on non-supply support areas such as attrition rate of RI maintenance staff, etc.

CHAPTER 4 - REPAIRABLE ITEM SUPPORT CONTRACT PAYMENT REGIME





ASD RI WEIGHTINGS

1. **60% for Demand Satisfaction Rate (DSR)**
2. **30% for Mean Time Between Arising**
3. **10% for Sustainable Support Metric(s)**

The third step in developing a Performance Based Contracting (PBC) model for Repairable Item (RI) Support contracts is to develop an appropriate performance payment approach.

RI SUPPORT TRANSITION PERIOD

The ASD PBC framework for RI Support activities does not envisage the introduction of the performance Payment Regime until a baseline for performance has been established. This would normally occur no later than 12 months from Acceptance but more importantly should be tied to a realistic milestone to ensure that it does not delay the introduction indefinitely. Benefits from a Transition Period include the opportunity to bed-in support systems and reporting mechanisms, and avoid initial and unrepresentative performance discrepancies. Importantly, performance measures and target levels are agreed and set at contract signature, prior to the transition period—transition periods are not to be used to vary pre-agreed performance measures and target levels.

One possible model for scheduling a Transition Period is provided in Figure 4-4-1. ASD Business Units are encouraged to negotiate a Transition Period which logically suits their particular delivery schedule, addressing the amount of the Monthly Service Fee, At Risk amount and any Incentive program which would apply at each stage. It may also be appropriate for the performance Payment Regime to be introduced for certain metrics before other higher risk metrics where the Transition Period is needed to effectively offset that risk.

The Transition Period should not be viewed as a research phase for selection of appropriate Metrics or achievable Targets. The Metrics and Targets should be agreed prior to contract signature and the Transition Period is merely a validation of the accuracy and significance of the data, given possible transition problems.

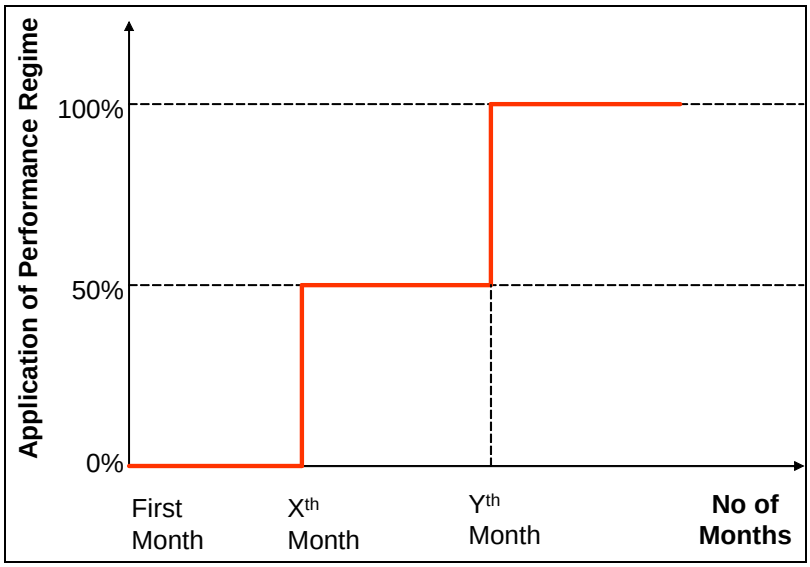


Figure 4-4-1: Application of Performance Regime during Transition Period

RI SUPPORT PAYMENT REGIME

As described in Chapter 7 of Part 1, there are 3 steps in developing a PBC payment model. These are:

STEP 1 - Determine contractor performance;

STEP 2 - Adjust for value represented by performance, and

STEP 3 - Weight the adjusted performance results.

Determine Contractor Performance

The data sources for the ASD RI Performance Metrics are provided below in Table 4-4-1.

Performance Metric	Data Source
Demand Satisfaction Rate	SDSS
Mean Time Between Arisings	NetMAARs
Contingency Equipment List Holdings	AIMS BART

Table 4-4-1: Data Sources for ASD RI Support Performance Metrics

Adjust for Value Represented by Performance

Figure 4-4-2 shows how performance should be adjusted to better reflect the value ASD considers is represented by contractor performance.

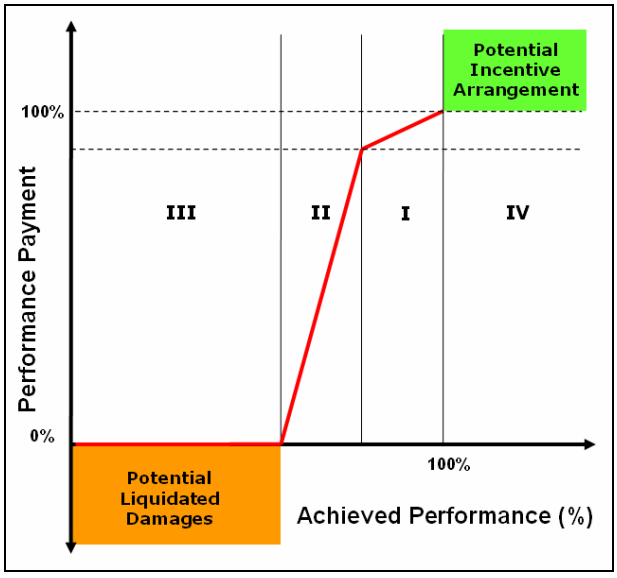


Figure 4-4-2: ASD Performance Payment Graph

For each Repairable Item (RI) Support contract, the ASD Business Unit needs to determine the conditions for Performance Bands I, II, III and IV. Performance Band I shows the range of performance from the contracted baseline (i.e. 100%) to a point of minor variation below the 100% level. The performance payment in this range also needs to be determined and agreed. Performance Band II is a range which represents major variation and payment would fall more rapidly in relation to performance in this Band to deter continued underperformance. When performance falls to an unacceptable level, shown by Performance Band III, Liquidated Damages may be initiated. The final decision for the ASD Business Unit is whether performance above the contracted baseline would be valued by Defence. Although exceeding the performance baseline may be representative of continuous improvement (such as improved DSR), care should be taken that the additional capability can be used. For example, exceeding CEL Holdings may increase inventory and obsolescence costs.

The selection of acceptable performance should be developed and flow down from the Materiel Agency Agreements (MAAs) for new acquisitions or Materiel Sustainment Agreements (MSAs) for legacy sustainment activities.

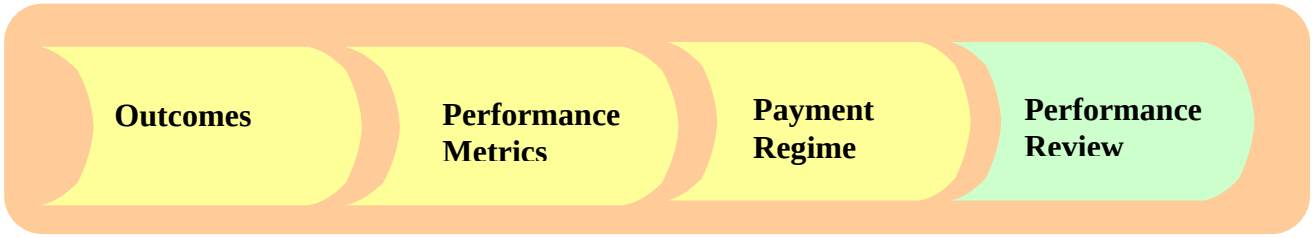
Weight the Adjusted Performance Results

The weightings given to the ASD RI Performance Metrics are provided in Table 4-4-2.

Performance Metric	Weighting (%)
Demand Satisfaction Rate	60
Mean Time Between Arisings	30
Contingency Equipment List Holdings	10

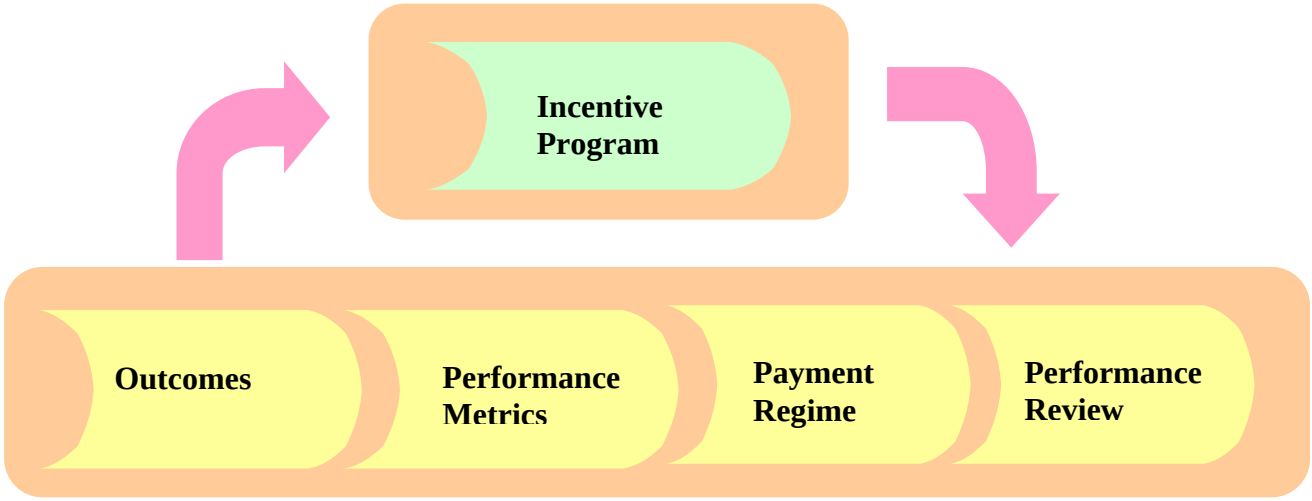
Table 4-4-2: Weightings of ASD RI Support Contract Performance Metrics

CHAPTER 5 - REPAIRABLE ITEM SUPPORT CONTRACT PERFORMANCE REVIEW



Performance Review should be commensurate with the financial and technical risk in the contract. In most instances, Performance Review could align with the performance review period (normally 3 months), which would enable performance data to be relatively stable. However, an ASD Business Unit may also request reporting of interim (e.g. monthly) performance data to enable proactive management of operational trends. The final timing, frequency and composition of the reviews should be determined by the individual ASD Business Unit.

CHAPTER 6 - REPAIRABLE ITEM SUPPORT CONTRACT INCENTIVE REGIME



As discussed in Chapter 8 of Part 1, ASD may offer financial and non-financial incentives for additional contract Outcomes from a Repairable Item (RI) Support contract. Options for four possible Outcomes for a RI Support contract Incentive Programs are outlined below.

Option 1 – Priority 1 Demand Performance

The first option for an Incentive Program that could be offered in a RI Support contract is based on the Outcome of reducing or eliminating Priority 1 Inabilities (e.g. Aircraft Operationally Grounded (AOG)) for the contracted RI(s). In this case, the contractor would be rewarded for 100% satisfaction of all Priority 1 demands within the contracted timeframe. This Incentive acts to reduce the interruption to operations which the availability of the RI may cause. It also acts as an additional incentive to the contractor to perform causal analysis of Priority 1 Inabilities, which has long term utility to Defence.

The incentive for Priority 1 Inability Performance should only be available to the contractor for a fixed duration between “re-baselining” activities, which should be approximately every 3 – 5 years. At the next “re-baselining” point, the new target for the incentive would be amended to reflect the historical average of the Priority 1 Inability Performance and incentives offered for better performance against this new level.

Option 2 – Average Waiting Time for Unsatisfied Priority 1 Demands

An alternative, or compliment, to Option 1 is an Incentive Program to the RI Support contract to reduce the Average Waiting Time for Unsatisfied Priority 1 Demands. This incentive has the most benefit for the transaction of existing (legacy) contracts to a PBC Framework given the implicit requirement for historical data on Average Waiting Time for Unsatisfied Priority 1 Demands.

Similar to option 1 this incentive acts to reduce the interruption to operations which the availability of the RI may cause. It also acts as an additional incentive to the contractor to perform causal analysis of Priority 1 Inabilities, which has long term utility to Defence.

The Incentive Program for reduced Average Waiting Time for Unsatisfied Priority 1 Demands should only be available to the contractor for a fixed duration between "re-baselining" activities, which should be approximately every 3 – 5 years. At the next "re-baselining" point, the new target for the incentive would be amended to reflect the historical average of the reduced Average Waiting Time, and incentives offered for better performance against this new level.

Option 3 – Increased Demand Satisfaction Rate (DSR) Performance

For a RI Support contract it is possible to provide an Incentive Program for the delivery of a DSR in excess of the RI Support contract baseline. However, it is important that the additional level of DSR performance and associated Defence capability is a sufficient increase so as to match potential increase in payment.

The incentive for increased DSR performance should only be available to the contractor for a fixed duration between "re-baselining" activities, which should be approximately every 3 – 5 years. At the next "re-baselining" point, the new target for the incentive would be amended to reflect the historical average of the increased DSR performance and incentives offered for better performance against this new level.

Option 4 – Commitment to Australian Industry Capability (AIC)

Refer to Chapter 6 of Part 2 for additional detail.

PART 5 – AERO ENGINE SUPPORT CONTRACTS

CHAPTER 1 - GETTING STARTED – AERO ENGINE SUPPORT CONTRACTS

References:

A. AAP 7001.053 Technical Airworthiness Management Manual
B. AAP 7001.054 Airworthiness Design Requirements Manual

INTRODUCTION

Part 1 of the ASD PBC Handbook described the general process for developing and implementing a PBC Framework. Parts 2, 3, and 4 of the ASD PBC Handbook then applied this general process to ASD contracts for Through Life Support (TLS), Contracted Maintenance (CM) Support and Repairable Item (RI) Support respectively. This Part considers the application of the PBC framework to the Aero Engine Support contracting scenario.

DEFINITION

Aero Engines are defined as aircraft propulsion systems, including complete engine systems, engine modules, RIs and Breakdown Spares (BDS), which form part of the authorised aircraft configuration.

Similar to CM and RI Support contracts, the scope of Aero Engine Support contracts can vary considerably from:

- simple CM activities, as an Authorised Maintenance Organisation (AMO), without the authority to develop design changes and Defence provided spares; through to
- complex TLS activities including:
  - various levels of maintenance as an AMO;
  - engineering management as an Authorised Engineering Organisation (AEO) including design changes development; and
  - logistics management including spares determination and procurement, obsolescence management, supply, storage and transportation.

While in simple terms, Aero Engines and their associated components, can be considered as RIs, ASD recognises their criticality to safe, effective and efficient operation of Air Vehicles. Accordingly, ASD has produced a PBC Framework specifically for Aero Engines given the following factors:

- Critical nature of an Aero Engine in both:
  - the airworthiness (safety) of the aircraft, and
  - the delivery of aircraft Availability to Defence.

- Relative complexity of the equipment. Aero Engine components are subjected to operating conditions which are often far more severe than for any other part of the platform. As a result, the materials in Aero Engines are highly advanced and the technology involved is extremely complex.
- Relative cost of the sustainment. Historically, the propulsion system may comprise up to 45% of the initial platform purchase cost, and over 35% of the total in-service support cost for the platform.

In recognition of these complexities ASD Business Units shall involve either DGTA-ESI1 staff, or another Aero Engine specialist, in the contracting process at the following stages:

- ***Contract Drafting/Negotiation:*** Provide a review on the technical content of the Contract (e.g. Function and Performance Specification (FPS)) as part of the Airworthiness Technical Regulatory Framework (TRF). This review includes tailoring of Part 5 of the ASD PBC handbook and is considered the most important stage as the outcomes and metrics are defined, and the and performance levels are set.
- ***Through Life Compliance Assurance:*** Assist ASD Business Units in ensuring contract compliance, through both performance and Engine Structural Integrity (ESI) management plan reviews, to maintain materiel capability for the ADF.

Additionally, IAW reference A (Regulation 3.5.5), it is mandatory that any ADF Gas Turbine Aero Engine, under both the acquisition and sustainment contracts, be managed through an Engine Structural Integrity (ESI) management plan. The ADF preferred management plan is the ESI Program (ESIP), as defined in reference A (Section 4, Chapter 1).

Accordingly, ASD Business Units are required to contact DGTA-ESI1 when any contracting activity is being considered. DGTA-ESI1 will allocate a TIER risk level to determine the level of DGTA-ESI1 involvement required to be incorporated under the terms of the contract.

PERFORMANCE BASED CONTRACTING

Figure 5-1-1 is the core PBC Framework which must be used to develop a PBC approach for an Aero Engine contract.

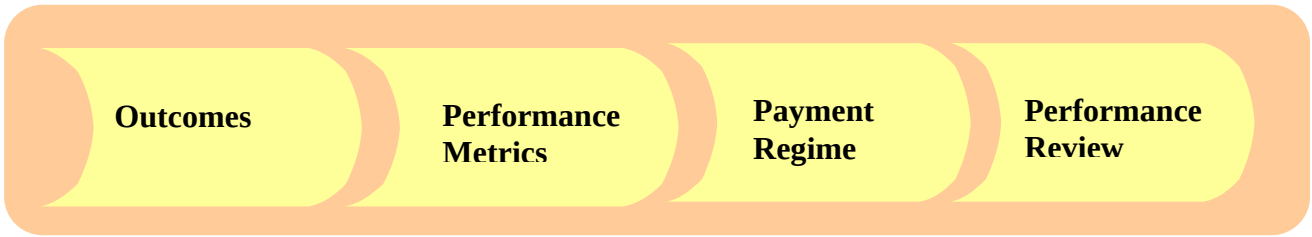
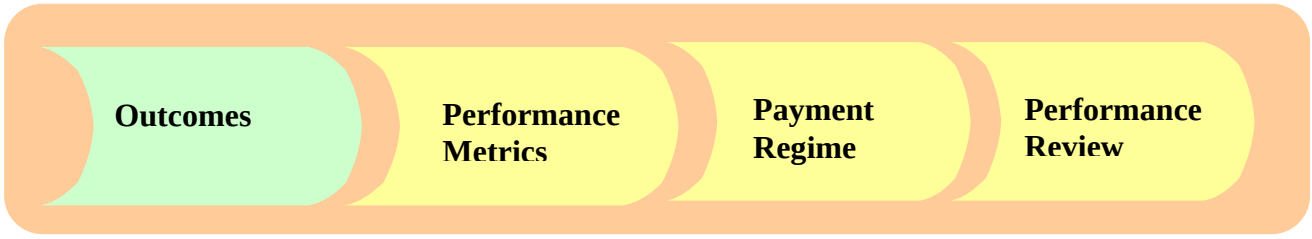


Figure 5-1-1: Aero Engine Support Contract Performance Framework Schematic

CHAPTER 2 – AERO ENGINE SUPPORT CONTRACT OUTCOMES



ASD AERO ENGINE CONTRACT OUTCOMES

1. **Available for Operation**
2. **Minimised impact on Operations**
3. **Sustainability of Supply**

Chapter 4 of Part 1 described how technical equipment performance could be represented by the Reliability Engineering characteristics of Availability, Reliability, Maintainability[27] and Supportability. These characteristics facilitate the identification of key outcomes for any contracting scenario. However, in determining the appropriate Outcomes for an Aero Engine contract, consideration should be given to the contribution these services make to the achievement of strategic and/or platform (i.e. Through Life Support (TLS)) level objectives. Thus, Figure 5-2-1 depicts how the Aero Engine contract Outcomes contribute to the platform level TLS objectives.

SAFETY

While the focus of the ASD PBC Handbook is primarily on performance management, it does not reduce or negate the contractor's responsibilities to produce and maintain materiel to a specified level of safety as either as an Authorised Engineering Organisation (AEO) or as an Authorised Maintenance Organisation (AMO).

Availability

In some cases, the availability of an Aero Engine or Aero Engine component may directly affect platform availability. However, it is more likely that the *Availability* in the context of a single Aero Engine, or Aero Engine component, can be measured by its ability to be

[27] Maintainability is considered a characteristic which is largely determined during the Acquisition phase of a Weapon System and is therefore not considered a useful basis for a Performance Metric in the Sustainment phase.

Available for Operations. This Outcome captures the importance of an Aero Engine, or Aero Engine component, availability in meeting operational demands which, in sum, achieves the *Assurance of Supply* Outcome at the platform level. Accordingly, the Outcome for Aero Engine availability is *Available for Operations*.

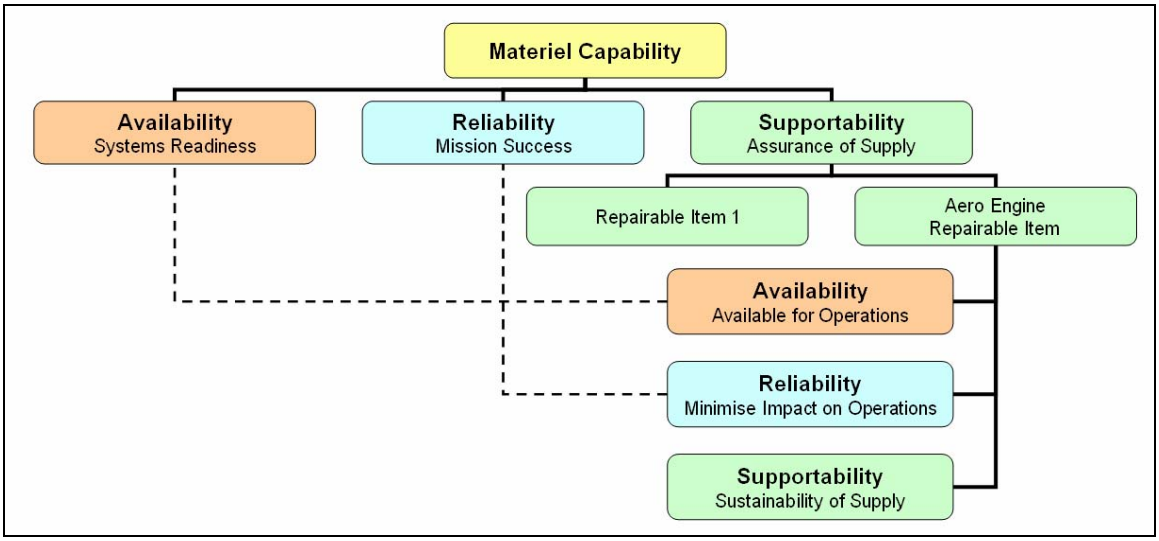


Figure 5-2-1: The contribution of Aero Engine Support Outcomes to TLS Outcomes

Reliability

Reliability of an individual Aero Engine or its components is of vital importance to Defence for three reasons:

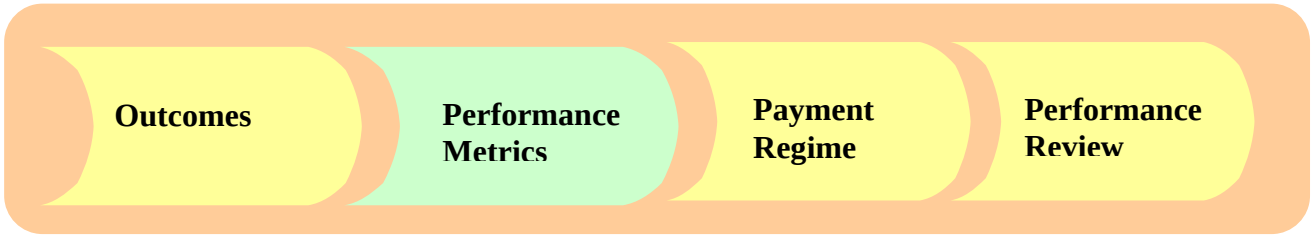
- direct linkage to hazardous situations at a platform level, which may include hull loss;
- significant impact on overall platform performance including availability through the additional maintenance burden of the platform; and
- given many Aero Engine or Aero Engine components are extremely costly, poor reliability will directly impact the Total Cost of Ownership (TCO) of the platform.

Accordingly, given Aero Engine reliability effects both effectiveness (e.g. *Mission Success*) and efficiency (e.g. TCO), the Outcome for Aero Engine reliability is to *Minimise Impact on Operations*.

Supportability

Supportability of an Aero Engine or Aero Engine components is a direct factor in the platform level supportability Outcome; *Assurance of Supply*. However, in this case the assurance must be sustainable over a longer timeframe (i.e. consistently delivered) to ensure supportability is maintained to an acceptable level. Accordingly, the Outcome for Aero Engine supportability is *Sustainability of Supply*.

CHAPTER 3 - AERO ENGINE SUPPORT CONTRACT PERFORMANCE METRICS



ASD AERO ENGINE PERFORMANCE METRICS

1. **Demand Satisfaction Rate (DSR) – Serviceable Engines**
2. **DSR – Engine Repairable Items (RI)**
3. **DSR – Engine Breakdown Spares (BDS)**
4. **Average Time On Wing (ATOW)**
5. **In-Flight Shut Down (IFSD) Rate**
6. **Engine Related Mission Abort (MA) Rate**
7. **Sustainability of Supply Metric(s)**

The second step in developing a PBC model is to identify Performance Metrics which give the best information about the Outcomes detailed in Part 5, Chapter 2. In the Aero Engine Support contracting scenario the following metrics have been chosen.

Available for Operations

The Metric which best informs Available for Operations is Demand Satisfaction Rate (DSR). By definition, DSR is defined as the percentage of successful delivery of item demands against contracted response times during a reporting period. This can be either against a single item (e.g. Part No, NSN, etc) or a range of items. However, in the case of Aero Engines it may be necessary to apportion this into specific areas to mirror the three distinct outcomes areas depending on the scope of the individual Contract:

- DSR – Serviceable Engines[28],
- DSR – Engine Repairable Items (RI), and/or
- DSR – Engine Breakdown Spares (BDS).

[28] Includes serviceable engines installed in aircraft and uninstalled.

Minimum Asset Level (MAL)

It is widely recognised that Demand Satisfaction Rate (DSR) provides the contractor with the ability to provide an innovative solution to Defence's requirement by only specifying Defence's need. However, there are times when the use of a DSR is problematic, mainly where there is insufficient demand to allow the use of percentage.

For example, consider a DSR calculated monthly with a 90% Contracted Level of DSR with 2 demands per month. In this example a single failed delivery (e.g. 1 of 2) results in a DSR of 50% which may result in a significant impact on the At Risk Margin invoking Liquidated Damages (LDs). Clearly with such low demand rates in the reporting the DSR performance may be too sensitive.

One alternative is the use of a Minimum Asset Level (MAL). MAL allows ASD to specify a number of Serviceable assets of a specified configuration to be made available at a prescribed location(s). As an item is taken the Aero Engine, or Aero Engine component, contractor must make another available to satisfy the MAL.

Where the calculation of DSR requires an assessment of *serviceable engines* from both CAMM2 and Australian Standard Defence Supply System (SDSS)[29] it may be possible to utilise NetMAARS to provide an automated report.

However, the utility of DSR may be reduced where there are significant Defence controlled processes.

Where calculation of DSR only requires SDSS, a DSR report is an automated function of SDSS.

[29] Australian military variant of Version 4.3.1.2 of the MINCOM software package MIMS

Effectiveness of Demand Satisfaction Rate (DSR)

DSR may become ineffective in cases where contractor and ADF logistics processes interface. For example, a DM contractor returns engine modules to an ADF ILM facility for engine assembly. In this case, if an OM unit demands an engine, DSR may be affected by a lack of modules delivered by the DM contractor, or a lack of manpower to assemble engines at the ILM facility, or both. In such cases, it may be appropriate to assign tailored DSR metrics for OM and ILM (i.e. a "DSR – serviceable modules" metric at ILM).

Care needs to be taken that contractor processes do not compromise Defence's requirements for visibility and coordination of supply support.

Minimised Impact on Operations

There are three possible metrics used to measure the contractor management of the Aero Engine and components to minimise its impact on operations: Average Time on Wing, In-Flight Shut Down Rate, and Engine Related Mission Abort Rate.

Average Time On Wing (ATOW). ATOW is an extremely important fleet reliability measure, providing an estimate of how long an engine can be expected to remain "on wing" (installed), on average. ATOW is calculated by determining the total time, in Engine Hours (ENHRs), each engine remained installed in an aircraft before it was removed for maintenance or an unserviceability. Engine Removals For Access (RFA) and engine cannibalisation events are excluded. These times are summed and divided by the total number of engines installed. ATOW is a lag indicator as the period of interest cannot include engines currently installed in aircraft. Furthermore, ATOW is an indicator of the maintenance burden on the operational unit.

In-Flight Shut Down (IFSD) Rate. The IFSD rate provides a primary metric in measuring the airworthiness of the Aero Engine fleet. IFSD rate is calculated by counting the number of IFSDs that occurred during the performance reporting period. IFSDs resulting from Foreign Object Damage (including birdstrike) shall be included in the IFSD rate since they may highlight possibilities for reliability improvement (eg Low Plasticity Burnishing of fan blades to prevent FOD). The FOD-related IFSD rate may be separated from the overall IFSD rate in order to distinguish events beyond the control of the contractor. IFSDs will be documented in the ADF Defence Hazard And Reporting Tool System (DHARTS), via Aviation Safety Occurrence Reports (ASOR).

Recording of Cause(s) for In-Flight Shut Down (IFSD)

It is essential to ensure each IFSD cause is also recorded, as even FOD related IFSDs may be the responsibility of the contractor (eg, object accidentally left in the engine core on engine build up). The IFSD cause metric is discussed in the System Health Indicators (SHI) section.

Engine Related Mission Abort (MA) Rate. The engine related MA rate is another important metric in measuring airworthiness of the Aero Engine fleet. Engine related MA rate is calculated by counting the number of engine related MA's that occurred during the performance reporting period. MA's will also be documented in the ADF DHARTS system, via ASORs.

Recording of Cause for Engine Relate Mission Abort (MA)

It is essential to ensure each engine related MA cause is recorded, even where responsibility for the MA event resides with the Commonwealth, since this may initiate corrective action on behalf of the Commonwealth. The engine related MA cause metric is discussed in the System Health Indicators (SHI) section.

Sustainability of Supply

Sustainability of Supply can be measured by a number of lead engineering and supply support metrics depending on the scope of the Contract, including *Outstanding Corrective Action Reports* (refer to Annex D to Chapter 3 of Part 2).

SYSTEM HEALTH INDICATORS (SHIs)

Guiding Principles

A second tier of performance metrics, known as System Health Indicators (SHIs), are essential and compliment the performance measures to ensure the overall PBC Framework adequately addresses Contract performance. As a result, both performance metrics and SHIs are critical to ensure materiel capability through contract compliance. However, SHIs are defined separately because they are metrics which cannot be used easily to calculate performance payments.

Representative Set of ASD TLS Systems Health Indicators

While the same principles on the use and application described in Part 2, Chapter 3 are valid, the critical nature of Aero Engines on platform airworthiness (safety) requires a number of mandated SHIs. From a policy aspect, SHIs identified in this section are required as part of the Engine Structural Integrity Management System, IAW reference A (Regulation 3.5.5) and reference B (Section 4, Chapter 1). A list of the ASD endorsed SHIs is described in annex A.

The endorsed SHIs described above and in annex A does not negate the need for additional SHIs either on behalf of ASD. Accordingly, in order to reduce the burden of data collection, ASD Business Units should also include relevant metrics from their Materiel Sustainment Agreements.

Annex:
A. Endorsed Set of ASD Aero Engine Systems Health Indicators (SHIs)

ANNEX A TO
CHAPTER 3
PART 5

ENDORSED SET OF ASD AERO ENGINE SYSTEMS HEALTH INDICATORS

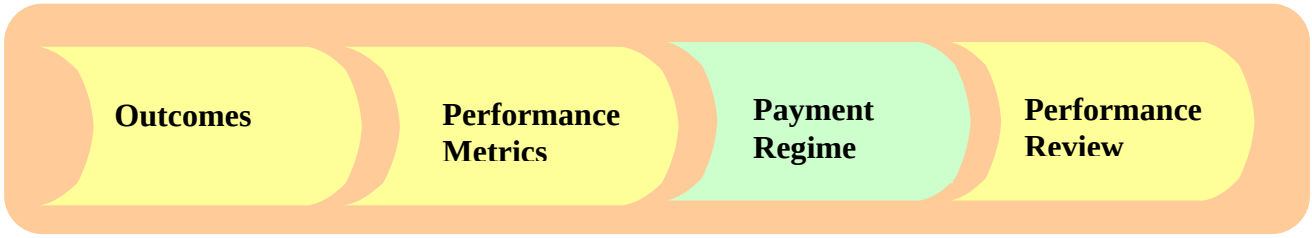
Metric	Definition	Data Source
Maximum Time On Wing Possible (MTOWP)	MTOWP is either: • overhaul (OH) interval of the engine, • interval of the shortest interval servicing which drives an engine "off wing", or • time equating to the life limit of the item with the lowest life limit. whichever is the shortest. MTOWP is not influenced by the engine build policy of the contractor, however MTOWP may be influenced by a number of factors, including: • engine design (age, type, modularity, etc), • maintenance philosophy, including engine build-up policy, • engine fleet size, • funding for spares, • ability to implement repair engineering solutions, • ability to influence OEM in redesign of unreliable parts, • OEM in service critical part life limit amendments.	
Average Potential Time on Wing (APTOW)	Report on the Potential Average Time of all complete engine assemblies fitted to Aircraft. The Average Potential Time on Wing (APTOW) provides an indication of the contractor's engine build policy. APTOW is calculated by first determining the predicted number of Engine Hours (ENHRs) that the engine would remain installed until the first scheduled maintenance event drives the engine off wing (i.e. life limited part life, OH interval, etc). Assumptions include:	NetMAARS and Local System

Metric	Definition	Data Source
	• (By definition) no engine removals for unscheduled failures, RFA, etc will occur • remaining life of each installed Life Limited Part will be consumed at the historical fleet average accrual rate The installed hours for all engines are then summed and divided by the total number of engines under consideration.	
Unscheduled Engine Removal (UER) rate	Report on the Unscheduled Engine Removal (UER) rate. The primary purpose of the UER rate is to identify unscheduled removal trends which may indicate issues with aging, changes in SOI/ROE, etc, which may then lead to corrective actions to improve the UER rate. A secondary purpose may be to predict future UER rate. The report should also specify whether the UER rate is within OEM specifications and, if necessary, detail contractor action such as warranty repair, change of maintenance internal, etc.	NetMAARS
Repeat Unscheduled Engine Removal (UER) causes	Report on the repeating causes for unscheduled engine removals. The number of repeating causes chosen for measurement (eg top 10 UER causes) is engine specific, and should be based on historical estimates or (for new Aero Engines) based on engine complexity and OEM component reliability estimates. The primary purpose of this metric is to identify unreliable parts and implement corrective actions to reduce high removal rates from specific causes. The report should also detail contractor action such as warranty repair, change of maintenance intervals, etc.	Local System
Repeat In-Flight Shut Down (IFSD) causes	Report on the repeating causes for In-Flight Shut Down (IFSD) events. The number of repeating causes chosen for measurement (eg top 10 IFSD causes) is engine specific, and should be based on historical estimates or (for new Aero Engines) based on engine complexity and OEM component reliability estimates. The primary purpose of this metric is to identify unreliable parts, poor maintenance practises, and opportunities to implement corrective actions to reduce IFSD events from specific causes. The report may also be used to predict future trends in IFSDs. The report should	Local System

Metric	Definition	Data Source
	specify whether there are any identifiable trends and if necessary, detail contractor action such as warranty repair, change of maintenance intervals, etc.	
Repeat Engine-caused Mission Abort (MA) causes	Report on repeating causes for Mission Abort (MA) events. The number of repeating causes chosen for measurement (eg top 10 MA causes) is engine specific, and should be based on historical estimates or (for new Aero Engines) based on engine complexity and OEM component reliability estimates. The primary purpose of this metric is to identify unreliable parts, poor maintenance practises, and opportunities to implement corrective actions to reduce MA events from specific causes. The report may also be used to predict future trends in MA's. The report should specify whether there are any identifiable trends and if necessary, detail contractor action such as warranty repair, change of maintenance intervals, etc.	Local System
No of Outstanding CARs	Report on the comparison of the resolution of the CARs for both AEO and/or AMO versus the assigned schedule. As an external accreditation process, AEO/AMO status ensures the quality of contractor engineering and maintenance services.	DGTA audit report from DGTA-DAIRENG or DGTA-DAIRMAINT as appropriate
Technical Information Review (TIR) Backlog	Report on backlog of Technical Information Review (TIR) actions. The backlog of TIR provides an indication of the workload, and by analysis, a measure of the excess capacity of the contractor and/or ASD Business Unit work force. This report must include a separate section detailing the number of OEM (or publication sponsor) amendments awaiting incorporation. This is an essential metric to provide the Commonwealth an indication of the currency of maintenance publications. Out of date publications may not reflect best practise and may impact Aero Engine reliability and supportability.	EMERALD Data Reporting Tool (when used). *Note: the use of EMERALD is not mandatory IAW AAP 7001.053 (AM1). However, Regulation 3.5.2 from AAP 7001 .053(AM1) requires that all Technical Information is captured.*

Metric	Definition	Data Source
For Turboshaft Aero Engines (optional for others): Power Assurance Test (PAT) or Health Indicator Test (HIT)	Trend the PAT and/or HIT results as required by maintenance publications. In addition, the report shall record all instances where an engine failed the PAT, and the root cause for the failure (if subsequently known).	IAW maintenance manuals or other local systems.

CHAPTER 4 - AERO ENGINE SUPPORT CONTRACT PAYMENT REGIME



ASD RI WEIGHTINGS

1. **30% for Demand Satisfaction Rate (DSR) – Serviceable Engines**
2. **20% for DSR – Engine Repairable Items (RI)**
3. **15% for DSR – Engine Breakdown Spares (BDS)**
4. **10% for Average Time On Wing (ATOW)**
5. **10% for In-Flight Shut Down (IFSD) Rate**
6. **10% for Engine Related Mission Abort (MA) Rate**
7. **5% for Sustainability of Support Metric(s)**

The third step in developing a Performance Based Contracting (PBC) model for Aero Engine Support contracts is to develop an appropriate performance payment approach.

AERO ENGINE TRANSITION PERIOD

The ASD PBC framework for Aero Engine Support activities does not envisage the introduction of the performance Payment Regime until a baseline for performance has been established. This would normally occur no later than 12 months from Acceptance but more importantly should be tied to a realistic milestone to ensure that it does not delay the introduction indefinitely. Benefits from a Transition Period include the opportunity to bed-in support systems and reporting mechanisms, and avoid initial and unrepresentative performance discrepancies. Importantly, performance measures and target levels are agreed and set at contract signature, prior to the transition period—transition periods are not to be used to vary pre-agreed performance measures and target levels.

One possible model for scheduling a Transition Period is provided in Figure 5-4-1. ASD Business Units are encouraged to negotiate a Transition Period which logically suits their particular delivery schedule, addressing the amount of the Monthly Service Fee, At Risk amount and any Incentive program which would apply at each stage. It may also be

appropriate for the performance Payment Regime to be introduced for certain metrics before other higher risk metrics where the Transition Period is needed to effectively offset that risk.

The Transition Period should not be viewed as a research phase for selection of appropriate Metrics or achievable Targets. The Metrics and Targets should be agreed prior to contract signature and the Transition Period is merely a validation of the accuracy and significance of the data, given possible transition problems.

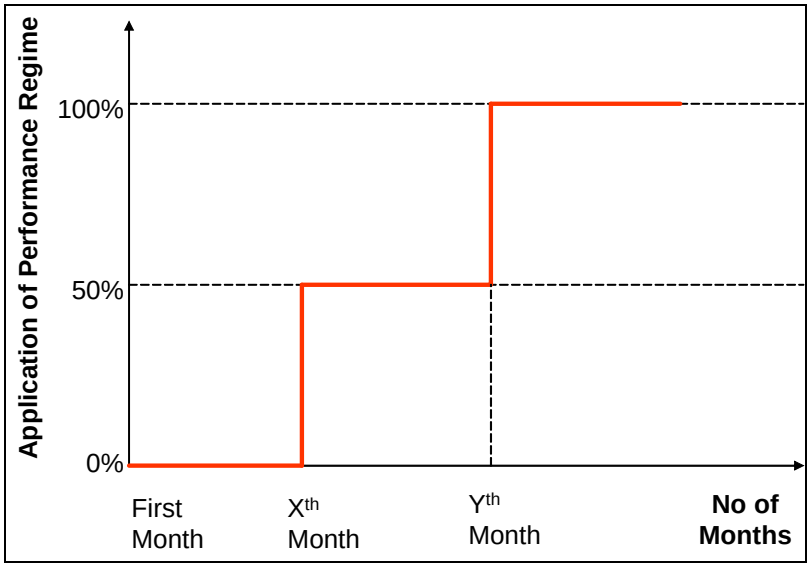


Figure 5-4-1: Application of Performance Regime during Transition Period

AERO ENGINE PAYMENT REGIME

As described in Chapter 7 of Part 1, there are 3 steps in developing a PBC payment model. The steps are:

STEP 1 - Determine contractor performance against specified performance metrics;

STEP 2 - Adjust for value represented by performance, and

STEP 3 - Weight the adjusted performance results

Determine Contractor Performance

The data sources for the ASD Aero Engine Performance Metrics is provided in Table 5-4-1.

Performance Metric	Data Source	Chart
Demand Satisfaction Rate (DSR) – Serviceable Engines	CAMM2 and SDSS or NetMAARS	Figure 5-4-2
DSR – Engine Repairable Items (RI)	AIMS BART	Figure 5-4-2
DSR – Engine Breakdown Spares (BDS)	AIMS BART	Figure 5-4-2
Average Time On Wing (ATOW)	CAMM2 or NetMAARS	Figure 5-4-2
In-Flight Shut Down (IFSD) Rate	DAHRTS/CAMM2 or NetMAARS	Figure 5-4-3
Engine Related Mission Abort (MA) Rate	DAHRTS/CAMM2 or NetMAARS	Figure 5-4-3
Sustainability of Support Metric(s)	Depends on Metric Chosen	Figure 5-4-2 or Figure 5-4-3 depending on performance measure chosen

Table 5-4-1: Data Sources for ASD Aero Engine Support Performance Metrics

Variations to the Rate of Effort (ROE)

As a part of the Commonwealth requirements an ROE figure will be provided. However, ROE may vary overtime due to a range of reasons including operational demands, modification programs, aging aircraft issues. This ROE variation can occur both on a month-to-month and year-to-year basis. Clearly variation in the ROE is important for the PBC Framework since a reduction in ROE may reduce the number of engines required and/or a reduction in the number of engine operating hours. In such a situation, the contractor may continue to meet many performance metrics satisfactorily, but do so at far less cost to itself. Alternatively, for an increase in ROE, the converse may be true.

In general, a maximum expected ROE be specified within the Contract by the Commonwealth, and should the annual ROE exceed the prescribed annual maximum an incentive payment may be implemented.

Variations to the Annual Rate of Effort (ROE) is a separate issue to that of the Fatigue Cycle Accrual Premium Payment discussed below.

Fatigue Cycle Accrual Premium Payment

The major basis of cost of a PBC Framework for Aero Engines is associated with the inspection, repair and/or replacement of Aero Engine material which suffers from fatigue damage. Unlike other Aerospace components fatigue is mission, rather than time related, and therefore dependant on the specified mission(s) provided by the Commonwealth in a Statement of Operating Intent (SOI). Examples of components most significantly affected by fatigue damage include rotating components such as disks, spools, shafts, drums, etc and may also include the combustion chamber case and rotor blades.

While not all Aero Engine components are affected by fatigue damage those components that are represent up to 65% of the engine through life support costs and therefore are considered the primary cost drivers. The reason for the disproportionate cost of these items is the potential for a failure to result in a catastrophic event (i.e. hull loss) and therefore these parts are "life limited[30]" in some way to ensure zero failures in service. Accordingly, variations to the mission which affect the fatigue accrual of these components, either an increase or decrease, will have the biggest potential to impact the contractors cost of business.

Similar to ROE, if it can be shown that variations to the mission will increase support costs, then it is recommended that a *fatigue cycle accrual premium payment* clause is inserted into the contract. The intent of a *fatigue cycle accrual premium payment* clause is to compensate a contractor for an increase in fatigue accrual from the baseline under the Commonwealth SOI specification which necessitates more frequent than expected component inspection/repair/replacements.

ASD Business Units should contact ESI1-DGTA or another Aero Engine specialist to determine the requirements for this clause.

Fatigue Cycle Accrual Premium Payment Clause

While the premium payment clause can be executed in several ways it is recommended that payments be based on realistic predicted effects to the fleet. Accordingly, the fatigue cycle accrual premium payments should, in the first instance, only focus on the variation in costs associated with inspection, repair and/or replacement of life limited parts. However, where there is evidence that non-life limited parts are also affected by the variation in mission the Commonwealth may review this claim.

[30] A "Life Limited" component has a specified operational (fitted) life which, when met, results in the component being made unserviceable until a maintenance action (e.g. inspection, testing, etc) may restore it. Alternatively, some "Life Limited" components will be discarded at the end of its "useful life".

Contracted Level for Average Time on Wing (ATOW)

In most circumstances, a minimum acceptable ATOW value should be specified to allow performance of the contractor to be measured (e.g. to receive full performance payment, the contractor shall produce engines such that the ATOW is greater than 400 ENHRs). Where service experience permits, the ATOW value may be based on the historical rate.

For new Aero Engines and Greenfield Aero Engine Support contracts, the ATOW figure may only be specified after examining the *Maximum TOW Possible* (MTOWP) for the particular Aero Engine, since ATOW depends fundamentally on MTOWP. The MTOWP metric is engine specific and is defined in the System Health Indicator (SHI) section in Part 5, Chapter 3. For new engines, the initial ATOW value should be set at 50% MTOWP (a figure derived from other modern Aero Engines); however, the value is dependent on several factors including engine design philosophy, engine fleet size and engine build policy, and must be carefully considered. Periodic review of this important metric will be essential to ensure best value for money is maintained for the Commonwealth.

Adjust for Value Represented by Performance

Figure 5-4-2 and Figure 5-4-3show how performance should be adjusted to better reflect the value ASD considers is represented by contractor performance, noting that the two separate graphs represent two individual circumstances.

Figure 5-4-2 depicts where the Adjusted Performance is reduced as the Achieved Performance against the performance measure gets smaller. Figure 5-4-2 relates to all the Demand Satisfaction Rate (DSR) and the Average Time On Wing performance measures.

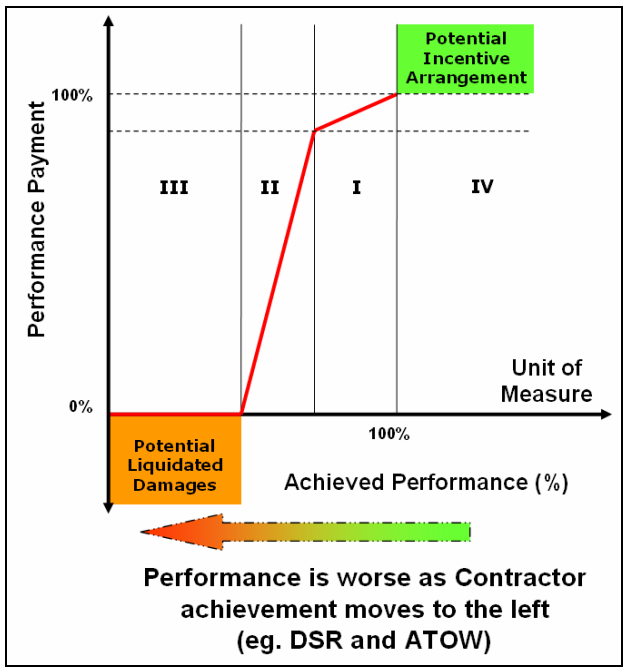


Figure 5-4-2: ASD Aero Engine Support Performance Payment Graph

Figure 5-4-3 below depicts where the Adjusted Performance is reduced as the Achieved Performance against the performance measure gets larger. Figure 5-4-3 relates to the In-Flight Shut Down (IFSD) and Engine Related Mission Abort (MA) rate performance measures.

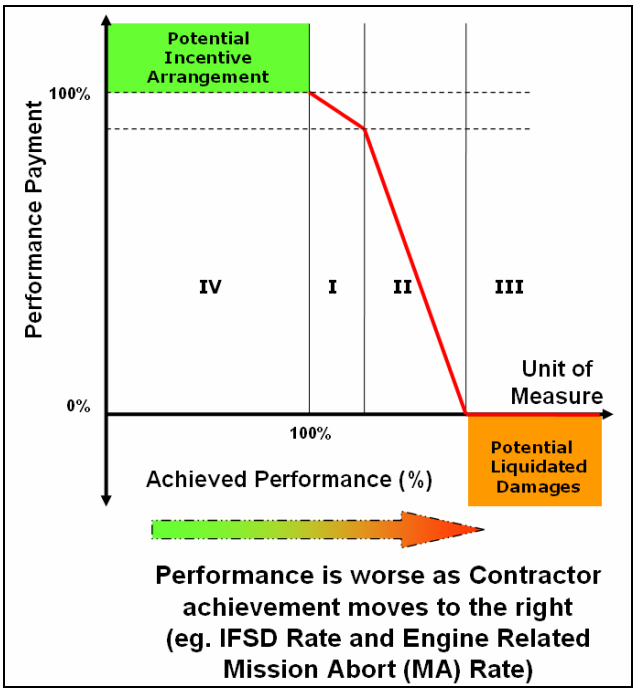


Figure 5-4-3: ASD Aero Engine Support Performance Payment Graph

For each Aero Engine Support contract, the ASD Business Unit needs to determine the conditions for Performance Bands I, II, III and IV. Performance Band I shows the range of acceptable performance variation from the contracted baseline (i.e. 100%) to a point of minor variation below this level. The performance payment in this range also needs to be determined and agreed. Performance Band II is a range which represents major variation and payment would fall more rapidly in relation to performance in this Band to deter continued underperformance. When performance falls to an unacceptable level, shown by Performance Band III, Liquidated Damages may be initiated.

The final decision for the ASD Business Unit is whether performance above the contracted baseline would be valued by Defence. Although exceeding the performance baseline may be representative of continuous improvement (such as improved DSR), care should be taken that the additional capability can be used.

The selection of acceptable performance should be developed and flow down from the Materiel Agency Agreements[31] (MAAs) for new acquisitions or Materiel Sustainment Agreements[32] (MSAs) for sustainment activities.

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31 An MAA formalises the relationship between the Defence Materiel Organisation (DMO) (as supplier) and Capability Development Executive (CDE) (as the customer) for the delivery of new capability in terms of how much and when. It also provides a means by which performance will be monitored over the course of the project. The MAA is about the high-level outputs that DMO has undertaken to deliver.

Weight the Adjusted Performance Results

The weightings given to the ASD Aero Engine Support contract Performance Metrics are provided in Table 5-4-2.

Performance Metric	Weighting (%)
Demand Satisfaction Rate (DSR) – Serviceable Engines	30
DSR – Engine Repairable Items (RI)	20
DSR – Engine Breakdown Spares (BDS)	15
Average Time On Wing (ATOW)	10
In-Flight Shut Down (IFSD) Rate	10
Engine Related Mission Abort (MA) Rate	10
Sustainability of Support Metric(s)	5

Table 5-4-2: Weightings of ASD Aero Engine Performance Metrics

[32] An MSA formalises the relationship between the Defence Materiel Organisation (DMO) (as supplier) and the Service Chief (as the customer) for the delivery of support to existing capability. It provides a means by which performance will be monitored based on the high-level outputs that DMO has undertaken to deliver.

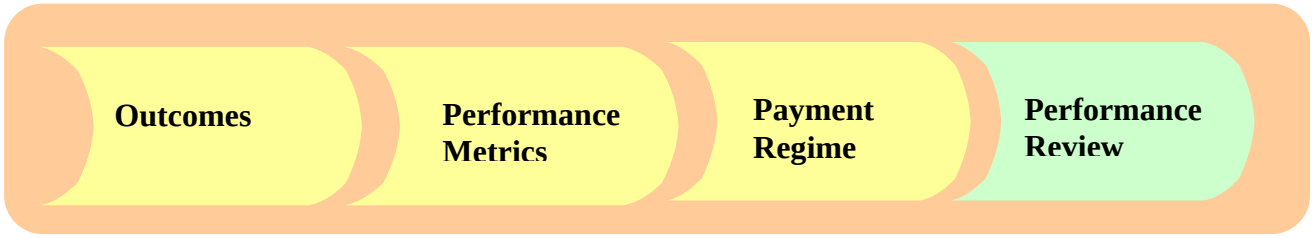
Aero Engine Performance Metric Weightings

The weightings of the Aero Engine Performance Measures provided in Table 5-4-2 are a starting point for ASD Business Units. It is expected that the ASD Business Units, with assistance of DGTA-ESI1 or another Aero engine specialist, will review these weightings for application for their specific Aero Engine contract scope. Depending on the type and scope of the contract, it may be appropriate to remove some of the metrics from Table 5-4-2, or add additional metrics (for example, removing the DSR – BDS and RI metrics for a complete platform PBC contract). Where the weightings in Table 5-4-2 are found to be inappropriate, the ASD Business Units must include the rationale for the variation in briefing material to the delegate.

Payment Regime Assessment and Scenario Analysis

Whatever payment regime is finally agreed upon, a detailed “role play” of the regime must be undertaken, with the involvement of ESI1 or another engine specialist, in order to ensure no anomalies or omissions exist in the contract which would disadvantage either the Commonwealth, or the contractor, after contract acceptance. Part of such a study must be a sensitivity analysis to determine the effects of failing to meet chosen performance metrics. Special attention should be made to the interaction between performance metrics. Where a metric provided in table 5-2 above is excluded from the contract, the study will assess the impact of this exclusion.

CHAPTER 5 - AERO ENGINE SUPPORT CONTRACT PERFORMANCE REVIEW

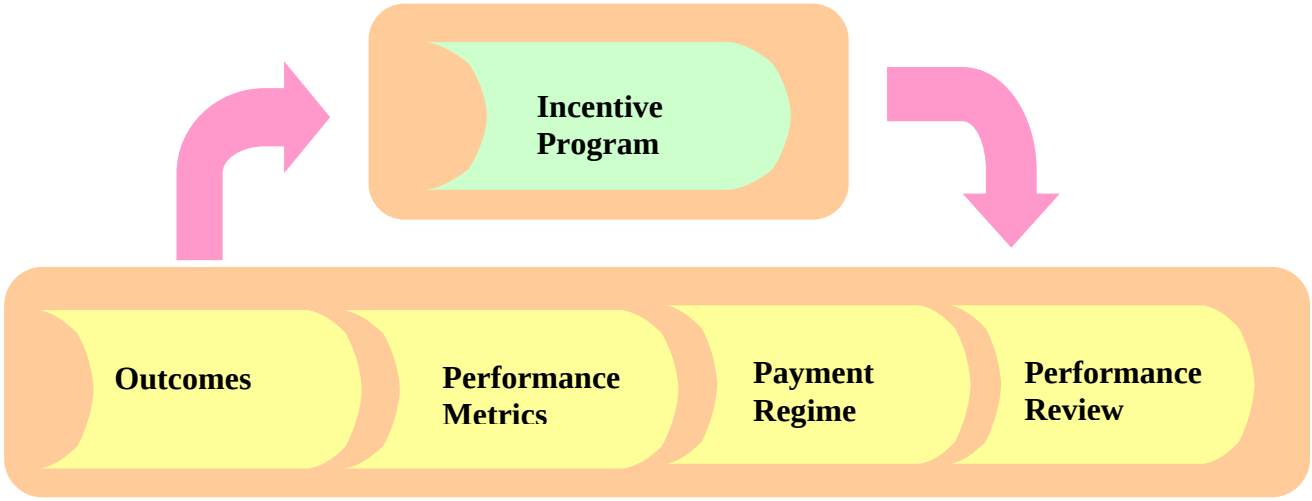


Performance Reviews should be commensurate with the financial and technical risk in the contract. In most instances, Performance Review could align with the performance review period (normally 3 months), which would enable performance data to be relatively stable. However, an ASD Business Unit may also request reporting of interim (i.e. monthly) performance data to enable proactive management of operational trends and to meet mandatory ASD Performance Reporting requirements. The final timing, frequency and composition of the reviews should be determined by the individual ASD Business Unit.

In the context of through-life contract performance review, DGTA-ESI1 is able to provide a "Centre of Expertise" (CoE) capability to Commonwealth compliance assurance staff. DGTA-ESI1 can provide assistance in two main ways:

- **Specialist Advice.** Offer advice to DMO including contract clause amendments, payment disputes, interpreting contract performance information effectively, etc; and
- **Targeted ESIP Audit Function.** Audit the effectiveness of PBC contracts as part of routine ESIP audit activity, undertaken each year. Such audits will include examination of how performance review is undertaken and an assessment of its effectiveness in ensuring contractual requirements are met.

CHAPTER 6 - AERO ENGINE SUPPORT CONTRACT INCENTIVE REGIME



As discussed in Chapter 8 of Part 1, ASD may offer financial and non-financial incentives for additional contract Outcomes from an Aero Engine Support contract. An option for a possible Outcome for an Aero Engine Support contract Incentive Program is outlined below.

Increase in Average Time on Wing (ATOW) Performance

An Incentive Program could be offered for the increase of the Time On Wing (TOW) of Aero Engines on an annual basis. Specifically, an incentive would be offered for an increase in ATOW in Engine Hours (ENGHR) for the current year compared to the previous year. This Incentive acts to reduce the potential future impact, in terms of engine replacement workload, on the Operating Maintenance (OM) units.

The incentive for Time On Wing (TOW) performance should only be available to the contractor for a fixed duration between “re-baselining” activities, which should occur approximately every 3 – 5 years. At the next “re-baselining” point, the new target for the incentive would be amended to reflect the historical average of the Time On Wing (TOW) performance and incentives offered for better performance against this new level.

Other possible incentives may relate to improving failure rates for the top UER causes, improving DSR, etc. There may also be an option for an incentive based on performance (thrust/power) of the engine above a baseline (taking care that this does not affect other metrics such as reliability). This is most appropriate for turboshaft engines but should not be discounted as a possibility for other Aero Engine types also. Finally, for turboshaft engines, an incentive based on the ability to meet and exceed PAT/HIT may be warranted.

PART 6 – ENGINEERING SERVICES SUPPORT CONTRACTS

ASD PBC Handbook (Version 2)
Part 6

To be issued

PART 7 - SUPPORTING DOCUMENTS

CHAPTER 1 – GLOSSARY

Term	Definition
Adjusted Performance	Achieved Performance adjusted to reflect the level of variation against the Performance Target, using the Performance Bands.
Achieved Performance	Raw performance results for the contractor for the Review Period.
Authorised Engineering Organisation (AEO)	An organisation that has been certified (awarded an Engineering Authority Certificate) by the Technical Airworthiness Regulator to provide design or engineering management services to the ADF. ***[AAP 7001.053 TAMM (AM1) Glossary]***
Airframe Hours (AFHRs)	The major unit of 'time' measurement for Reliability Engineering for Aerospace equipment, excluding Aero Engines (refer to Engine Hours).
Authorised Maintenance Organisation (AMO)	An organisation that has been certified (awarded a Maintenance Authority Certificate) by the Technical Airworthiness regulator and authorised by the relevant Maintenance Authority Body (MAB) to conduct maintenance on ADF aircraft and aeronautical product. ***[AAP 7001.053 TAMM (AM1) Glossary]***
Assurance of Supply	The provision of the right materiel and services, at the right place, at the right time and with the right quality and the sustainment of that support over time. ***[AFLSC]***
At Risk Margin	The At Risk Margin is the percentage of the Contract Price that is subject to Performance-based Payment. It is the expectation of Aerospace Systems Division that the At Risk margin be at least equal to the Contract Profit Margin.
Availability	A measure of the degree to which an item is in an operable and committable state at the start of the mission, when the mission is called for at an unknown (random) time. ***[ADO RAM Manual]***
Available Aircraft	Available Aircraft is the number of aircraft in a prescribed configuration and serviceability level, excluding those awaiting Defence controlled processes or authorised decisions, supplied by the contractor at a nominated prescribed time.
Cannibalisation	The removal of a serviceable Repairable Item (RI) or component from one system or high-level spare, in order to use that item to make another system available to undertake operations. ***[ASDEFCON(Support) Glossary]***

Term	Definition
Capability	The power to achieve a desired operational effect in a nominated environment within a specified time and to sustain that effect for a designated period. ***[Capability Systems Life-Cycle Management Manual]***
Capability Manager	A Defence Executive held accountable for the management of a Capability. ***[Capability Systems Life-Cycle Management Manual]***
Contracted Maintenance (CM)	Contracted Maintenance is described as those maintenance services not required to be organic to the relevant Service (i.e. Navy, Army or Air Force) or ASD Business Unit. Organic Maintenance are those services essential to direct operational support and/or required to be undertaken in the Area of Operations (AO). Contracted Maintenance contracts normally include performance of maintenance, supply support and associated engineering services, likely to include AMO and AEO responsibilities. However, Contracted Maintenance contracts can vary in scope from relatively simple, short duration activities, such as aircraft wash, to more complex modification incorporation or Deeper Maintenance servicings.
Contingency	The provision of support by the contractor, in addition to the requirements of the contract, to meet the Commonwealth's requirements for support during heightened ADF operations. ***[ASDEFCON(Support) Glossary]***
Critical Failure	A Critical Failure is defined as any performance degradation, failure or combination of failures, affecting equipment hardware, software or both, resulting in the loss of a Mission through the loss of any of the required equipment functions to the minimum level of performance specified. ***[ASD RAM Centre of Expertise]***
Demand Satisfaction Rate (DSR)	The percentage of successful delivery of Repairable Items and Consumables/Break Down Spares demands against contracted response times.
Direct Costs	Costs, which can be attributed specifically to the activity and therefore the contractor's actual costs of doing business. ***[DLSE Life Cycle Support Glossary]***
Directed Level Of Capability (DLOC)	The Directed Level of Capability (DLOC) is an agreed and funded level of capability based on Government strategic and financial guidance. DLOC is the funded average level of capability maintained during a specified budget period, normally a financial year. ***[Australian Defence Doctrine Publication 00.2, Preparedness and Mobilisation]***

Term	Definition
Engine Hours (ENHRs)	The unit of 'time' measurement for Reliability Engineering for Aero Engines.
Fully Mission Capable (FMC)	The system [aircraft] is capable of doing all of its assigned missions ***[(United States) Air Force Instruction (AFI) 10-602]***
Fully Mission Capable (Contractor) [FMC(C)]	An FMC(C) aircraft is an FMC aircraft that is waiting for Defence controlled processes or decisions to be completed. The term FMC(C) indicates that the contractor has met its obligations in producing an FMC aircraft.
General and Administrative Overhead (G&A)	G&A is the allocation of the contractor's budget to managing and administering personnel.
Incentive Programs	Strategies and mechanisms that encourage contractors to meet or improve contractor performance in high value activities detailed in the contract. ***[DPPM]***
Key Performance Indicator (KPI)	A performance measure defined by the Australian Defence Contract (ASDEFCON) templates to monitor contractor performance against contractual requirements.
Liquidated Damages	An amount agreed between the parties to a contract, as a genuine pre-estimate of damages to be recoverable from the party in the event of specified breaches of the contract. ***[DPPM]***
Maintainability	The relative ease and economy of time and resources with which an item can be retained in or restored to, a specified condition when maintenance is performed by personnel having the specified skill levels, using prescribed procedures and resources, at each prescribed level of maintenance and repair. ***[ADO RAM Manual]***
Materiel Acquisition Agreement (MAA)	An MAA formalises the relationship between the Defence Materiel Organisation (DMO) (as supplier) and Capability Development Executive (CDE) (as the customer) for the delivery of new capability in terms of how much and when. It also provides a means by which performance will be monitored over the course of the project. The MAA is about the high-level outputs that DMO has undertaken to deliver.
Materiel Sustainment Agreement (MSA)	An MSA formalises the relationship between the Defence Materiel Organisation (DMO) (as supplier) and the Service Chief (as the customer) for the delivery of support to existing capability. It provides a means by which performance will be monitored based on the high-level outputs that DMO has undertaken to deliver.

Term	Definition
Mission Critical Item List (MCIL)	MCILs lay the groundwork for reporting the status of aircraft capability. They list the minimum essential systems and subsystems that must work on an aircraft for it to perform specifically assigned unit wartime, training, test or other missions. This is equivalent to the Mission Essential Subsystem List (MESL) as used by the United States Air Force and described in para 2.25.1 of the (United States) Air Force Instruction (AFI) 10-602.
Mission Profile	The Mission Profile of a system is a thorough description of all of the major planned events and conditions associated with one specific mission. A mission profile is one segment of a life-cycle profile (for example, a missile captive-carry phase or a missile free-flight phase). The profile depicts the time span of the event, the expected environmental conditions, energised and non-energised periods, and so forth. ***[ADO RAM Manual]***
Mission Reliability Model	A Mission Reliability Model is simply a hierarchical breakdown of the necessary sub-systems, components, etc necessary for the successful operation of system based on the FMC MCIL and includes redundancy. Task 201 of MIL-STD-756B, Reliability Modelling and Predictions, November 1981 provides guidance on the development of a Mission Reliability Model. Typically a Mission Reliability Model of the system will be delivered as part of the Acquisition Contract Integrated Reliability, Maintainability and Testability Plan (IRMTP) and Integrated Reliability, Maintainability and Testability Case Report (IRMTCR).
Mission Success Rate	The ability of an item to perform its required functions for the duration of a specified Mission Profile. ***[ADO RAM Manual]***
Not Mission Capable (NMC)	The system [aircraft] cannot do any assigned missions ***[(United States) Air Force Instruction (AFI) 10-602]***. All aircraft that are not FMC and not accepted by the Commonwealth as PMC would be classed Not Mission Capable (NMC).
Outcomes	In this context, Outcomes are the strategic objectives for the Defence Capability.
Performance Based Contracting (PBC)	A concept which aims for goal convergence between the contractor and the Commonwealth, by measuring and rewarding contractor performance against Capability Outcomes. Also called Performance Based Contracting.

Term	Definition
Partially Mission Capable (PMC)	The system [aircraft] is operating in an impaired condition. It can perform at least one, but not all of its assigned missions ***[(United States) Air Force Instruction (AFI) 10-602]***.
Payment Regime	In the context of the Handbook, the Payment Regime describes the method that payment is modified due to changes in the contractor's Achieved Performance against the Performance Target.
Performance Bands	A delineation of Achieved Performance Outcomes to define Major and Minor Variation, and Unacceptable performance ranges.
Performance Metric	The articulation of an Outcome in a specific, simple, meaningful and measurable term.
Performance Payment	The portion of the 'At Risk' margin ultimately paid to the contractor as a result of its performance in the preceding Review Period.
Performance Review	In the context of the Handbook, the Performance Review is the specific review charged with: • reviewing and agreeing the contractor's Achieved Performance for the Reporting Period for each Performance Measure, and • modifying the contractor's payment in line the specific Contract Payment Regime.
Performance Target	The standard for the Performance Metric as specified in the contract.
Preparedness	A combination of Readiness and Sustainability. ***[Capability Systems Life-Cycle Management Manual]***
Rate of Effort	The work loading to be undertaken by the contractor based on the set level of operations conducted by the Commonwealth during a period nominated in the contract. ***[ASDEFCON(Support) Glossary]***
Readiness	The ability to prepare a Capability for operations within a designated time. ***[Capability Systems Life-Cycle Management Manual]***
Reliability	The probability that an item will perform its specified function for a specified interval under stated conditions. ***[ADO RAM Manual]***

Term	Definition
Reliability Engineering	The design, construction and use of an item to ensure that it will perform its specified function for a specified interval under stated conditions. ***[ADO RAM Manual]***
Repairable Item (RI)	Defined as items of equipment which can be restored to perform all of their required functions by corrective maintenance. ***[LOGMAN AL3, DOD-HDBK-791(AM)]***
Reverse Logistics	Process whereby the Commonwealth transfers Repairable Items in an unserviceable state back to a contractor for action.
Review Period	The interval agreed in the contract for assessment and payment against the contractor's Achieved Performance, typically 1 – 3 months.
Small and Medium Enterprise (SME)	An SME is an Australia or New Zealand firm with fewer than 200 full time equivalent employees. ***[Commonwealth Procurement Guidelines]***
Supportability	The degree to which the Mission System design characteristics and the planned or existing Support System enable operational and preparedness requirements to be met. ***[ASDEFCON(Support) Glossary]***
Sustainability	The ability to maintain a Capability on operations for a specified period. ***[Capability Systems Life-Cycle Management Manual]***
Systems Health Indicator (SHI)	A series of performance measures which measure the current and future condition of an enabling process.
System Readiness	Confidence that an item will be available when required as measured by Availability. ***[ADO RAM Manual]***
Through Life Support	A whole-of-life management methodology that integrates all support and services for materiel systems. ***[AAP 1004 Air Force Logistics Support Concept (AFLSC)]***
Turn-Around-Time	That element of time needed to transport, service, repair, or check out an item for recommitment. ***[ASDEFCON(Support) Glossary]***
Weapon System	Items that can be used directly by the armed forces to carry out combat missions. ***[US DoD Acquisition Deskbook Glossary]***
Weightings	Relative priorities given to each Performance Metric for the purposes of calculating the Performance Payment.

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Australian Government

Department of Defence

Defence Materiel Organisation

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DEFENCE MATERIEL ORGANISATION | AEROSPACE SYSTEMS DIVISION