Notification of Changes for PYRAMID Exploiter's Pack Issue 3.0 - Version 6.0 compared to Version 4.1

For further information regarding how you can exploit PYRAMID on your project or have a technical query that you would like answering, please contact the PYRAMID Team using the following email address. PYRAMID@mod.gov.uk

This publication is available on the Defence Share PYRAMID Support Environment (PSE).

EXECUTIVE SUMMARY

The MOD's PYRAMID programme resulted in the development of the PYRAMID Exploiter's Pack, which includes the PYRAMID Reference Architecture, helping to make the next generation of air systems affordable, capable and adaptable through the adoption of an open architecture approach and systematic software reuse.

The PYRAMID Exploiter's Pack is now in the process of being developed into a standard with a supporting guidance document. Prior to its formal publication, the standard and supporting guidance document are herein referred to as PYRAMID Exploiter's Pack Version 6.0, despite being structured differently to prior versions of the PYRAMID Exploiter's Pack.

This document provides advance notice of the changes planned to be incorporated in the PYRAMID Exploiter's Pack at Version 6.0 when compared to Version 4.1.

DOCUMENT HISTORY

Date	Issue	Description of Changes
August 2022	1.0 [Not released]	First issue for notification of changes for PYRAMID Exploiter's Pack Version 4.1 compared to Version 3.1.
November 2022	1.1	Up-issued as a DEFCON 703 deliverable – content of the report is unchanged from Issue 1.0.
August 2023	2.0 [Not released]	Up-issued for notification of changes for PYRAMID Exploiter's Pack Version 5.0 compared to Version 4.1.
October 2024	3.0	Up-issued for notification of changes for PYRAMID Exploiter's Pack Version 6.0 compared to Version 4.1.

List of Effective Pages

30 pages in total

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ABBREVIATIONS USED IN THIS DOCUMENT

Definitions of project terms used in this document can be found in the PYRAMID Exploiter's Pack Annex D: Glossary (Ref. 1).

REFERENCES

Reference	Title, Document Number, Issue and Date
1.	PYRAMID Exploiter’s Pack Version 4.1 Annex D: Glossary Issue 12.1, RCO_FUT_23_008, September 2023.
2.	PYRAMID Exploiter's Pack Version 4.1 Annex A: PYRAMID Reference Architecture Description Document Issue 4.1, RCO_FUT_23_005, September 2023.

1 INTRODUCTION

The MOD's PYRAMID programme resulted in the development of the PYRAMID Exploiter's Pack, which includes the PYRAMID Reference Architecture, helping to make the next generation of air systems affordable, capable and adaptable through the adoption of an open architecture approach and systematic software reuse. PYRAMID Exploiter's Pack Version 4.1 is openly available.

The PYRAMID Exploiter's Pack is now in the process of being developed into a standard with a supporting guidance document. Prior to its formal publication, the standard and supporting guidance document are herein referred to as PYRAMID Exploiter's Pack Version 6.0, despite being structured differently to prior versions of the PYRAMID Exploiter's Pack.

PYRAMID Exploiter's Pack Version 6.0 is being produced by BAE Systems on behalf of the United Kingdom (UK) Ministry of Defence (MoD). The UK MOD will establish the publication of the PYRAMID Exploiter's Pack as the PYRAMID Technical Standard Version 1 and PYRAMID Technical Standard Guidance Version 1. The PYRAMID Exploiter's Pack Version 5 was not made available, since this was a stepping stone towards standardisation.

1.1 Purpose

This document provides advance notice of the changes planned to be incorporated in the PYRAMID Exploiter's Pack at Version 6.0 when compared to Version 4.1.

2 Upcoming Changes

This document details the changes intended to be introduced between Version 4.1 (Ref. 2) and Version 6.0 of the PYRAMID Exploiter's Pack. The contents of this document describe the intended changes known about at the time this document was produced. It is possible that circumstances may change between the production of this document and the delivery of Version 6.0 of the PYRAMID Exploiter's Pack resulting in alteration of the planned content. Therefore parties making plans based on this document should be aware of the slight risk that the final delivered product may not contain some of the changes detailed here or may contain additional changes.

Impacted Baseline:	Version 4.1
Target Baseline:	Version 6.0

Purpose of Change
• Transition of the PYRAMID Exploiter's Pack to a PYRAMID Technical Standard and a PYRAMID Technical Standard Guidance document. • To enhance the PYRAMID Reference Architecture artefacts to a greater level of clarity and accessibility. • To address component scope issues that have been identified by users of the PRA.

2.1 Standardisation Changes

Due to the transition to a PYRAMID Technical Standard there needed to be a number of structural changes to certain elements of the PYRAMID Exploiter's Pack.

These changes can be seen in Figure 1: Document Structure Changes, and include new introductory content to support the new structure.

In general the technical nature of the content remains unchanged. Any technical changes are detailed later in this document.

Additionally, to better reflect their content, the Policies have been renamed PYRAMID Concepts. However, to maintain consistency with PYRAMID Exploiter's Pack Version 4.1, they are still referred to as policies within this document.

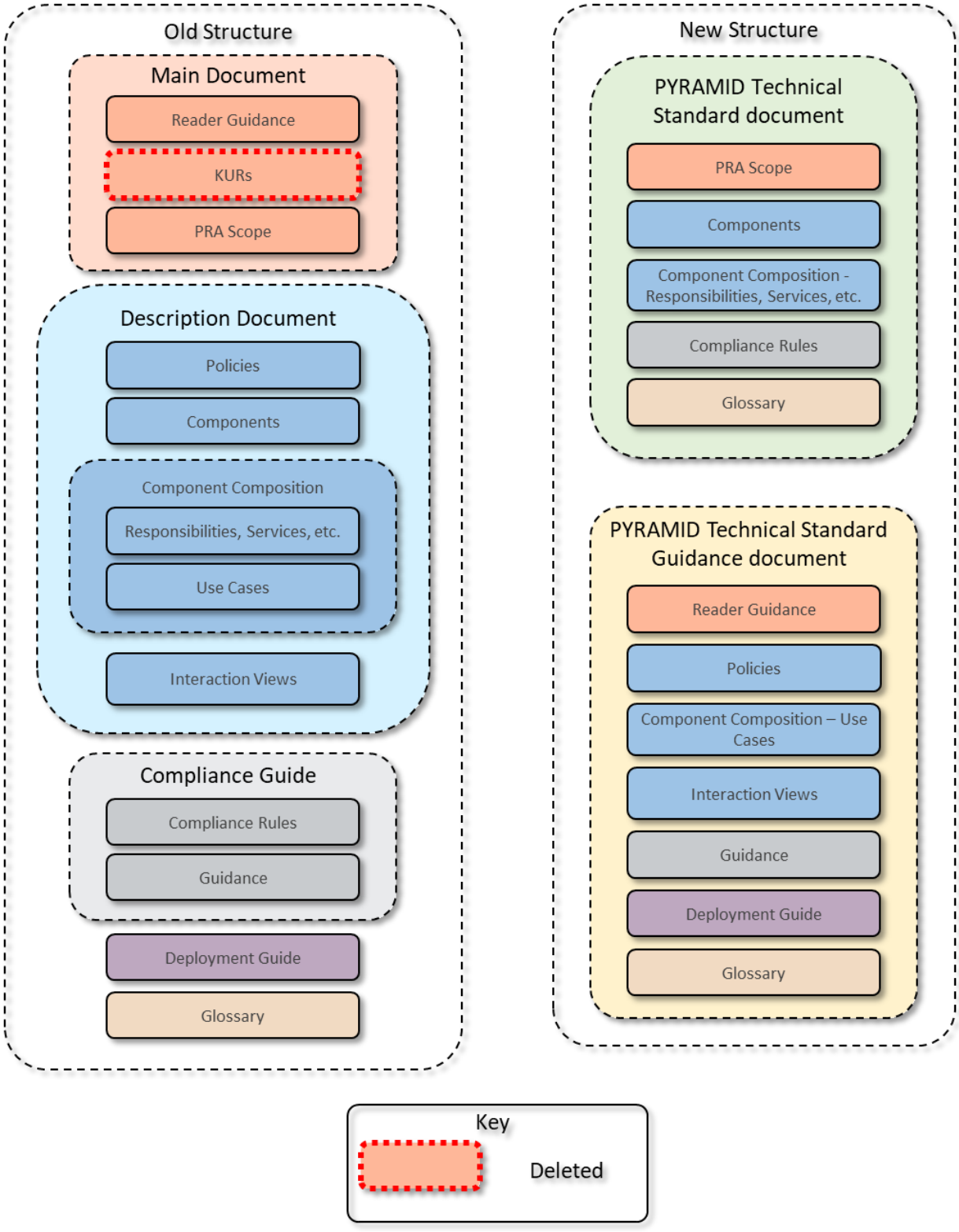

Figure 1: Document Structure Changes

2.2 Key Changes

Summary of Key Changes
• Transition of the PYRAMID Exploiter's Pack to a PYRAMID Technical Standard and a PYRAMID Technical Standard Guidance document. • Update to the compliance rules (although the sentiment of not polluting components remains, so previously compliant components should not be impacted by the updated compliance rules in the PYRAMID Technical Standard). • Incorporation of generic component responsibilities and service in the component composition. • Changes to resource management and conflict resolution concepts, including the removal of the Resource Brokerage component and the addition of the Conflict Resolution component. • Removal of the Path Demands component. • Update to the Tasks component definition and tactics extension examples. • Improvement to Deployment Guide readability.

2.3 Summary of Changes

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
Restructured the PYRAMID Exploiter's Pack into the PYRAMID Technical Standard and PYRAMID Technical Standard Guidance documents.	The PYRAMID Exploiter's Pack has been developed into a standard and a guidance document. This has resulted in: • The redistribution of the PYRAMID Exploiter's Pack contents, which was made up of five documents, into two documents – the PYRAMID Technical Standard and the PYRAMID Technical Standard Guidance. For the most part this does not change the content, it just reorganises it. • The identification and separation of normative content and informative content. All normative content is included in the PYRAMID Technical Standard. • Other changes that are detailed within the change summary, including revision of the compliance rules and expansion of the component composition.	For the most part the move to a standard (with supporting guidance) should not impact previously developed PYRAMID components. Any specific changes to what the PRA requires, such as modified PRA component definitions, are detailed elsewhere in the change summary. As long as the spirit of the previous compliance rules has been followed, previously compliant components should not be impacted by the change in compliance rules.
Identified key Policy content	The PYRAMID policies have been assessed for any normative content included within them. Where the policies include normative content that is not explicitly included within the PRA component set or the component composition, this has been added to the relevant PRA component definition or the component composition.	Generally none, since the additional normative content generally expands, or clarifies, what a PYRAMID component can do without requiring that it must be done. However, some clarifications to specific PRA components could result in some developed PYRAMID components more clearly being

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
	A summary table is now included within each policy, which points to the explicit normative content within the PRA that is covered by the policy, and summarises any other key guidance or exploiter considerations covered within the policy. The assessment has also resulted in a number of improvements to the policies, predominately to improve clarity.	identified as non-compliant if they have introduced pollution.
Removed the Path Demands Component	The Path Demands component has been removed from the PRA and its subject matter is now distributed across the following components, resulting in modification to these components: • Routes • Vehicle Guidance • Vehicle Performance	Path Demands PYRAMID components will not be compliant and may not be compatible with other PYRAMID components. The existing developments of the following components may need updating to expand their capability: • Routes • Vehicle Guidance • Vehicle Performance
Modified Resource Management and Conflict Resolution concept	The approach to resource management, described by the Resource Management policy, has been modified. The Resource Brokerage component has been removed and its responsibilities merged with other components. A component called Conflict Resolution has been added to resolve conflicts through a process of brokering and arbitration for both resource and non-resource conflicts.	Resource Brokerage PYRAMID components will not be compliant or compatible with other PYRAMID components. The capability previously provided by Resource Brokerage is now handled by the relevant resource component relating to the associated resource. It may therefore be possible, with limited modification, to

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
	The Spectrum component has been updated to clarify its ability to allocate portions of the spectrum 'resource'. The services on various resource components have been updated, predominately to include missing services that are necessary to request resource use or to refine existing services used for this purpose. Services have been incorporated into the component composition to support conflict resolution.	incorporate previously developed Resource Brokerage designs into the associated resource components or to specialise/configure previously developed Resource Brokerage designs for a single resource type – thereby creating a specialised version of a resource component containing just the resource allocation capability. Exploiters that have previously developed resource components may need to develop these components further to incorporate resource allocation capability. If exploiters have already developed a Spectrum component, there is a risk that it may not be compliant to the now more specific PRA component definition. Deployments with resource management capability will require modification to align to the new resource management component interaction pattern.
Revised the definition of 'resource component'	The Control Architecture and Interaction with Equipment policies have been updated to revise the definition of 'resource component' and to clarify the expected interactions between resource components.	If an exploiter has developed resource components (e.g. Mechanical Positioning) to include the subject matter of Sensors and Effectors, they will not be PYRAMID compliant. The changes made to the Control Architecture policy in regards to resource

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
		components should clarify their intended use.
Clarified the use of Bridges	The recommendations for what should and should not be included in a bridge have been updated and clarified. These updates are included in the Component Connections policy.	None, since the changes are not prescriptive. The changes are intended to support the rationale for the compliance rules for bridges and to aid exploiter's in understanding the different bridge options that are available to them.
Updated the Component Composition	The component composition now includes generic responsibilities and services, which are applicable to most or all PRA components – such as services to support data logging. The generic nature of these means that they cannot be meaningfully specialised within the PRA for any specific component and so can be used for any PYRAMID component development. The component composition service activities and service dependency diagrams have been enhanced to more clearly show the interactions between different services and activities within services.	None, since the changes are not prescriptive. The changes are intended to aid exploiter's in future development.
Updated the Compliance Rules	The rules for compliance have been modified. The compliance guidance has also been updated accordingly.	As long as the spirit of the previous compliance rules has been followed, previously compliant components should not be impacted by the change in compliance rules.

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
Raised the profile of the concept of 'Counterparts'	The Component Connections policy and Deployment Guide have been updated. Minor changes elsewhere to align.	The additional guidance on counterparts should assist exploiters in how to establish counterpart relationships between components in a deployment.
Improved application of Constraint Management	The Constraint Management policy has been updated to aid clarity.	The additional explanations and clarifications should help exploiters to understand the similarities and differences between requirements (e.g. tasks or actions) and constraints, which are derived by components and placed on other components.
Improved application of Capability restoration	The 'Capability Assessment' policy has been renamed to 'Capability Management', and has introduced capability shortfalls content.	The additional explanations highlight to exploiters the potential need for systems to be able to recover capability and describe how the PRA supports this. Exploiters that have already implemented recovery of capability may not have done so in exactly the same way proposed within the PRA component composition; however, if the broader PRA principles have been followed (such as separation of subject matter) then this should not result in compliance issues.
Raised profile of the concept of 'planning context'	The Dependency Management policy has been updated. Minor changes elsewhere to align.	None, no change to underlying principles. Pertinent information is simply more visible and clearly described.
Revised the concept of Multi-Vehicle Coordination	The Multi-Vehicle Coordination policy has been updated.	The multi-vehicle coordination policy should be more accessible and easier to read. A number of examples of how a deployment could be developed could have previously

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
		been interpreted as being mandated. These have now been clarified, providing exploiters with greater flexibility.
Clearer definition provided of the Tasks component, including the use of Tactics extensions	The definitions of entities and services in the Tasks component has been improved. The tactics extensions have been moved out of the PRA components list and into the Component Extensions policy.	The additional detail and changes aid exploiters: • The subject matter of the Tasks component and its role within a system, including how it is distinct from other components and the level of abstraction at which it operates verses the level of abstraction of other components has been clarified. • The scope of the services has been expanded and so may endorse additional content already added to services by an exploiter on their developed components. • Clarification added that the Tactics extensions to Tasks are only examples and do not need to be adopted or adhered to. If exploiters have already developed a Tasks component, there is a risk that it may not be compliant to the now more specific PRA component definition.
Updates to Deployment Guide to aid accessibility and readability	The Deployment Guide has been updated to improve readability, including additional explanation of existing concepts.	The Deployment Guide should be more accessible and easier to read. Clarification and additional explanation of various existing concepts within the deployment guide is provided, leading to a consistent message with less potential for misinterpretation.

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
Provided a clear definition for the hierarchy of Health Components	The Health Management policy has been updated, particularly in relation to the hierarchy of health components. Notably that instances of the Health Assessment component would map to equipment or structures rather than PRA components within the control architecture.	If an exploiter has developed instances of the Health Assessment component mapping to individual PRA components in their deployment, then they will be misaligned with the updated Health Management policy. This would not cause a compliance issue, but it may not be ideal for the deployment.
Applied maintenance fixes to PRA Components	Corrections and/or clarifications are incorporated within the following components: • Anomaly Detection • Asset Transitions • Authorisation • Collision Avoidance • Communication Links • Communicator • Countermeasures • Cryptographic Methods • Data Distribution • Destructive Effects • Effectors • Environment Integration • Environmental Conditioning • Flights • Health Assessment • Human Interaction • Interlocks • Jettison • Location and Orientation • Mass and Balance	In many cases there should be no impact, due to the changes being clarifications rather than corrections: • Anomaly Detection • Asset Transitions • Communication Links • Cryptographic Methods • Destructive Effects • Effectors • Environmental Conditioning • Health Assessment • Jettison • Mass and Balance • Mechanical Positioning • Operational Rules and Limits • Spectrum • Stores Release In some cases, the scope of the services has been expanded and so may endorse additional content already added to services

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
	• Mechanical Positioning • Network Routes • Networks • Objectives • Operational Rules and Limits • Power • Propulsion • Reference Times • Release Effecting • Semantic Translation • Sensor Data Interpretation • Sensors • Spectrum • Stores Release • Target Engagement • Tasks • Test • Vehicle Stability and Control	by an exploiter on their developed components: • Authorisation • Collision Avoidance • Communicator • Data Distribution • Environment Integration • Flights • Human Interaction • Interlocks • Location and Orientation • Networks • Network Routes • Objectives • Power • Propulsion • Reference Times • Release Effecting • Semantic Translation • Sensors • Tasks • Test • Vehicle Stability and Control In other cases, the services have been modified in a way that may require exploiters (who chose to use services and align them with the PRA) to modify their services on their developed components: • Countermeasures

Change Summary	Anticipated EP Impact	Anticipated Exploiter Impact
		• Sensor Data Interpretation • Target Engagement
Applied maintenance fixes to Interaction Views	Interaction Views updated to fix previously identified issues and bring in-line with the most recent PRA paradigms where applicable.	No impact. General improvements and clarification of content only.
Maintained consistency across all Exploiters Pack elements	The Deployment Guide, Compliance Guide, Glossary, Policies and Interaction Views have been updated to remain consistent with updates made to the PRA. Aligned component definition structure (including responsibility and service ordering) for all components.	More consistency will make the documentation easier to use.

Table 1: Summary of Changes

2.4 Impacted Policies and Components

Policy summary tables have been added to all the policies, but these are not listed as policy changes in Table 2: Summary of Policy Changes.

Policy	Changed	Summary of Change
Control Architecture	Y	Resource layer section reworded to align with change to Resource Management policy. Resource layer definition changed. General Principles refined with some principles consolidated.
Constraint Management	Y	Updated to provide additional detail and clarification. The main updates include recognition that constraints can be present internally within a component, such as being set through data driving, and so are not just required by other components.
Dependency Management	Y	Achievement and Progress reporting clarified and updated to explicitly include achievement reporting. Solution Re-planning section updated. Planning Context section updated. Conflict Resolution section added.
Autonomy	N	
Health Management	Y	Correction of recommendations on how to specialise the Health Assessment and Anomaly Detection components within a deployment. Hierarchy of Health Components re-written to provide clarification. Minor clarifications throughout.
~~**Capability Assessment**~~ **Capability Management**	Y	Policy renamed from Capability Assessment to Capability Management. Addition of new 'capability shortfalls' section, which includes information about recovering lost capability.
Multi-Vehicle Coordination	Y	Policy restructured and improved to demonstrate how the control aspects of the PRA can be applied to multi-vehicle scenarios. Information relating to flights and formations has also been added.
Interaction with Equipment	Y	Clarification to the use of and interactions between resource components.

Policy	Changed	Summary of Change
Resource Management	Y	Modification to the approach to resource management, including the introduction of a new component interaction pattern for resource management and modifications to resource management related component responsibilities.
Operational Support	Y	Clarification to the handling of simulation, and other minor amendments and clarifications.
Storage	Y	General clarifications and consolidation of duplicated content.
Recording and Logging	Y	General clarifications to content.
Cyber Defence	Y	Minor corrections to content.
Human-Machine Interface	N	
Interfacing with Deployable Assets	Y	Minor corrections to content.
Tactical Information	Y	'Separation of Tactical Information from Data Handling' and 'Separation of Data Handling and Control' sections re-written to clarify the difference between Sensor Products and Data Fusion.
Test	Y	Updated to clarify why testing is important.
Use of Communications	Y	Large parts of the policy have been updated to more clearly articulate the policy concepts, in particular the concepts of components being communications agnostic or communications aware, and what constitutes a communications capability component.
Data Exchange	Y	Updated to clarify that the policy applies wherever appropriate, and not just where there is a boundary between distinctly separated systems (e.g. different air vehicles).
Component Connections	Y	Guidance on bridges expanded and updated. Updated and expanded content on the topic of counterparting, with some restructuring within the policy to accommodate the new content. Examples of Component Interaction Patterns section moved from an appendix in the Deployment Guide.

Policy	Changed	Summary of Change
		General clarifications to content.
Component Extensions	Y	Updated to clearly define the definition of an extension and to improve the guidance for their use.
Data Driving	Y	Significantly updated to improve readability, add important considerations and guidance, and to ensure that the concepts are not dependent on any specific software development approach.
Safety Analysis	N	
Security Approach	N	

Table 2: Summary of Policy Changes

Component	Changed	Summary of Change
Component Composition	Y	The component composition content has been restructured and its use is now explained in more detail. The main structural change is the separation of the supporting use cases which are now in the PYRAMID Technical Standard Guidance document, from the rest of the component composition content, which is in the PYRAMID Technical Standard. The component composition has been expanded to include generic responsibilities and services, which can be utilised on any component. These responsibilities and services are not shown on the individual PRA components since, at the level of abstraction shown within the PRA, they would appear identical in all PRA component definitions. This includes services used for obtaining authorisation (from the Authorisation component) to carry out activities, placing constraints on other components, and supporting resolution of conflicting demands on a component. Other aspects of the component composition have also been updated to support these changes.

Component	Changed	Summary of Change
Anomaly Detection	Y	Clarification on the role and subject matter of the component to emphasise that the component deals with anomalous behaviour, not just anomalous states.
Asset Transitions	Y	Clarification throughout (including the role, subject matter semantics, design considerations, and services), including clarification on why the component would be needed.
Authorisation	Y	Clarification to the responsibilities and subject matter semantics. A new service has been added to allow the component to obtain contextual information, supporting determination of if and when authorisation is required or valid.
Collision Avoidance	Y	Minor corrections to content.
Collision Prediction	N	
Communication Links	Y	Services updated to fix minor editorial issues.
Communicator	Y	Communicator_Resourcing service has been added.
Conflict Resolution	Y	Component added to resolve conflicts through a process of brokering and arbitration for both resource and non-resource conflicts.
Countermeasures	Y	Responsibilities and standard pattern of use updated to included improved examples. Services consolidated to establish consistency of approach used for other PRA components.
Cryptographic Materials	N	
Cryptographic Methods	Y	Services updated to fix minor editorial issues.
Cyber Defence	N	
Data Distribution	Y	Control Architecture layer changed from Resource to Service. Clarification throughout (including to the overview, subject matter semantics, and

Component	Changed	Summary of Change
		services) and the expansions of the Capability_Evidence service to cater for evidence of the capability to prepare (e.g. format) data for distribution.
Data Fusion	N	
Destructive Effects	Y	Services updated to fix minor editorial issues.
Effectors	Y	Effector_Resourcing service updated to include achievement interface. Subject matter semantics updated to capture changing an effector state without causing an effect. Overview and role updated to fix minor clarification issues.
Environment Infrastructure	N	
Environment Integration	Y	Tactical_Information service renamed to Assett_Information and updated to include man made features such as navigational beacons. Services updated to fix minor editorial issues. Overview updated to clarify examples of use. Assumptions updated to fix minor editorial issues.
Environmental Conditioning	Y	Subject matter semantics reworked to clarify the subject matter of the component, with associated modification of the responsibilities to align to the semantics.
Flights	Y	Minor corrections to content.
Fluids	N	
Formations	N	
Geography	N	
Health Assessment	Y	Minor clarifications to services. Design rationale updated to clarify Health Assessment component can use extensions.
HMI Dialogue	N	

Component	Changed	Summary of Change
Human Interaction	Y	Minor corrections to content.
Information Brokerage	N	
Information Presentation	N	
Interlocks	Y	Control Architecture layer changed from Resource to Service.
Inventory	N	
Jettison	Y	Assumptions, design rationale, and multiple services updated to clarify distinction between this component and the Stores Release component.
Lights	N	
Location and Orientation	Y	Updated to clarify the equal significance of the derivatives of location and orientation (e.g. velocities and accelerations) compared to the location and orientation information within the subject matter semantics and the services, and to expand the capability evidence that can be used within the Capability_Evidence service.
Mass and Balance	Y	Mass_And_Balance_Limit service updated to be more aligned with Constraint_Dependency service.
Mechanical Positioning	Y	Subject matter semantics, responsibilities, overview, design considerations, and safety considerations updated to clarify distinction between this component and the Effectors component.
Navigation Sensing	N	
Network Routes	Y	Transmission_Dependency service updated to include new activity.
Networks	Y	Minor corrections to content.
Objectives	Y	Clarification throughout (including to the safety considerations, responsibilities, subject matter semantics, and services) and the introduction of a new Information_Dependency service to obtain information.
Observability	N	

Component	Changed	Summary of Change
Operational Rules and Limits	Y	Limits service updated to be more aligned with Constraint_Dependency service.
~~**Path Demands**~~	Y	Component removed.
Pointing	N	
Power	Y	Information_Dependency service added and Power_Information service renamed to State_Information.
Propulsion	Y	Two new services created for the interaction with lower level resource components. Measurement entity description updated.
Reference Times	Y	Clarification throughout (including to the overview, entities, and services) and the expansion of the scope of the services to allow information about reference times to be obtained.
Release Aiming	N	
Release Effecting	Y	Store_Sensor_Information service added. Minor corrections to content.
~~**Resource Brokerage**~~	Y	Component deleted.
Routes	Y	New responsibility added called determine_routing_continuity. Constraints service updated to correct minor content. New exclusions added for clarification.
Semantic Translation	Y	Safety considerations updated.
Sensing	N	
Sensor Data Interpretation	Y	Clarification throughout (including to the overview, design considerations, subject matter semantics, and services) and modification to the scope of the consumed services.
Sensor Products	N	
Sensors	Y	The Sensor_Resourcing service has been updated to allow the component to be able to determine the status of resource requests for supporting resources.
Signature	N	

Component	Changed	Summary of Change
Spatial Correction	N	
Spectrum	Y	Control Architecture layer changed from Service to Resource. Clarification throughout (including to the overview, responsibilities, subject matter semantics, design considerations, and services). Capability and Capability_Evidence services added.
Storage	N	
Stores Release	Y	Responsibilities reworded to clarify distinction between this component and Jettison.
Susceptibility	N	
Tactical Objects	N	
Target Engagement	Y	Services updated to fully account for Deployable and Non-deployable asset selection and use.
Tasks	Y	Clarification throughout (including to the overview, design considerations, safety considerations, security considerations, subject matter semantics, and services), including a clearer definition of how the component is distinct from other components and the level of abstraction at which it operates verses the level of abstraction of other components. The scope of the services is expanded to allow the component to issue constraints as well as actions.
~~Tasks Extension: Tactics: Aerial Refuelling~~	Y	Tactics extension example deleted.
Tasks Extension: Tactics: Attack	Y	Tactics extension example moved to new 'Examples of Tasks Extensions' section within the Component Extensions policy. Overview created and clarification throughout (including to the role, responsibilities, and design rationale) to provide a fuller explanation of the example Tasks extension.

Component	Changed	Summary of Change
Tasks Extension: Tactics: Communication	Y	Tactics extension example moved to new 'Examples of Tasks Extensions' section within the Component Extensions policy. Overview created and clarification throughout (including to the role, responsibilities, and design rationale) to provide a fuller explanation of the example Tasks extension.
~~**Tasks Extension: Tactics: Contingency**~~	Y	Tactics extension example deleted.
Tasks Extension: Tactics: Search	Y	Tactics extension example moved to new 'Examples of Tasks Extensions' section within the Component Extensions policy. Overview created and clarification throughout (including to the role, responsibilities, and design rationale) to provide a fuller explanation of the example Tasks extension.
~~**Tasks Extension: Tactics: Survival**~~	Y	Tactics extension example deleted.
Tasks Extension: Tactics: Transit	Y	Tactics extension example moved to new 'Examples of Tasks Extensions' section within the Component Extensions policy. Overview created and clarification throughout (including to the role, responsibilities, and design rationale) to provide a fuller explanation of the example Tasks extension.
Test	Y	Authorisation_Dependency service deleted, since authorisation is common to all components and so is now covered globally through the component composition. Clarification to the System_Condition service and modification to the scope of the Capability_Evidence service.
Threats	N	
Trajectory Prediction	N	
Undercarriage	N	
User Accounts	N	
User Roles	N	
Vehicle External Environment	N	

Component	Changed	Summary of Change
Vehicle Guidance	Y	Scope expanded to include checking that the demanded guidance is 'fit for purpose' as well as clarifications to what is meant by 'trajectory'. This has resulted in changes throughout the component definition, including to the responsibilities, services, and subject matter semantics.
Vehicle Performance	Y	Scope expanded to include the responsibility to determine the active performance regime, rather than being told which performance regime to select. The role, overview, responsibilities, subject matter semantics, and services have been updated accordingly.
Vehicle Stability and Control	Y	Clarification throughout (including to the overview, assumptions, subject matter semantics, and services) and the introduction of a new Environment_Information service to obtain information about the vehicle environment.
Weather	N	

Table 3: Summary of Component Changes