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**PMA-268 STINGRAY PLM STATEMENT of WORK (SOW)**

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**Prepared by:**

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**The Unmanned Carrier Aviation (UCA), PMA-268 Product Lifecycle Management (PLM)**

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NAICS Code 541330: This industry comprises establishments primarily engaged in applying physical laws and principles of engineering in the design, development, and utilization of machines, materials, instruments, structures, processes, and systems. The assignments undertaken by these establishments may involve any of the following activities: provision of advice, preparation of feasibility studies, preparation of preliminary and final plans and designs, provision of technical services during the construction or installation phase, inspection and evaluation of engineering projects, and related services.

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Note: Recommended changes to this document can be initiated by submitting a Software Change Request (SCR) to the Configuration Control Board, as described in the PMA-268 Change Management Procedures. SCRs are posted on the TBD website.

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# Introduction

The Unmanned Carrier Aviation (UCA) Multi-Mission Unmanned Aerial System (MQ-25) Program has a requirement for a Product Lifecycle Management (PLM) system. A PLM system allows the program to digitally thread all product life cycle processes that are needed to design, develop, test, produce and support a product. Using standards, authoritative data sources, existing Information Technology (IT), common software, hardware and approved networks ensures that complete, secure and authoritative engineering data is received and stored to facilitate PMA-268 ability to accelerate the product development cycle and lower support costs for integration of new capabilities. By digitizing our processes and moving to a digital product baseline, the digital thread can positively influence operational readiness by allowing rapid access to the authoritative data for support and enabling next generation of design engineers the data needed to maintain and improve on designs to meet future product life cycle requirements.

In order to determine the detailed requirements, implementation strategy, design, development, and production of the PMA-268 Siemen’s Teamcenter™ Product Lifecycle Management system, PMA-268 has a adopted an Agile methodology approach to product development. For the remainder of this document the Siemen’s Teamcenter™ Product Lifecycle Management system will be references as the “PLM System”

# SCOPE

## Development Approach

This SOW will contain capabilities required to design, develop, integrate, test and sustain the PLM system to meet program requirements utilizing an Agile methodology development approach utilizing Model Based Systems Engineering.

### Environments

The current PLM System is located in the Amazon Web Services (AWS) Government Cloud IL5 environment. Our original ATO was approved on July 15, 2021 for the Development and Production Environments. In FY22, we are adding the Test and QA (stage) environments. The PLM System is a hybrid cloud model because we use resources from the on premise Data Center resources; such as our F5 for our application security and load balancing. The physical and logical architecture is available upon award. However, a list of our software/hardware is available by request. We utilize 2 ATO accreditation for our complete system. We use AWS’s infrastructure and physical controls to define the AWS architecture and how they meet our cybersecurity requirements. We use the NAVAIR Data Center ATO for all of the architecture physically located in Pax River.

All environments have monthly and quarterly cybersecurity requirements to ensure we are maintaining our accreditation and ensuring all scan vulnerabilities are identified and fixed in a timely manner.

Deliver a major version release of the Digital Systems Model (DSM) and associated training modules. (CDRL A003 & A006)

### Business Process Approach

The PLM System will be one of the key IT systems used by PMA-268 in the Major Business Unit areas of technical data management.

#### Program Management Overview

A management discipline focused on controlling the cost, schedule and performance of a project or group of projects to achieve a stated goal. For the PLM System tasking a Program is the overarching group of projects needed to manage the entire MQ-25 Stingray Program.

1. The PLM System will address Program Management into 3 PLM Management Categories which are:
   1. Air System (MQ-25)
   2. Multi Domain Control System (MDCS)
   3. Peculiar Support Equipment (PSE)

#### Project Management Overview

A management discipline focused on initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria.

1. The PLM System will address Project Management into 6 PLM pillars which are:
   1. Program Management (PM)
   2. Program Document Management  
      (PDocM)
   3. Product Data Management (PDM)
   4. System Integration Management   
      (SI)
   5. Application Integration Management  
      (AI)
   6. Infrastructure Management  
      (IM)

#### Engineering Management Overview

A management discipline where engineers combine management skills with technical expertise to coordinate work in various technical fields such as product design, development, and manufacturing.

1. The PLM System will address 3 PLM Engineering Management Categories which are:
   1. Engineering Management
   2. Testing Management
   3. Data Management

#### Life Cycle Logistics Management Overview

A management discipline where logisticians plan, develop, implement, and manage a comprehensive affordable and effective system support strategy within the total life cycle systems management. Life cycle encompasses the system’s acquisition, sustainment, and disposal states.

1. The PLM System will address Life Cycle Logistics Management into 4 PLM Management Categories which are:
   1. Life Cycle Logistics Management – What data needs to be managed?
   2. Life Cycle Sustainment Management – How does the data need to be managed?
   3. Technical Management – What is the relationship with the data between engineering and logistics?
   4. Infrastructure Management – What is the physical and logical architecture of the PLM System? What are the internal and external interfaces needed?
   5. Peculiar support equipment – How does Support Equipment get managed and integrated within the PLM System?

This SOW describes the MQ-25 Program need for the PLM System. MBSE is a system engineering methodology that focuses on creating and exploiting domain models as the primary means of information exchange between engineers, rather than a document-based information exchange. MBSE is a formalized application of modeling to support system requirements, design, analysis, verification, and validation activities beginning in the conceptual design phase and continuing throughout development and while keeping the later life cycle phases in context at the beginning of the development. Essentially the MBSE PLM System merges the traditional system engineering processes and results and integrates them into the sustainment model at NAVAIR which is tied to the 12 integrated Product Support (IPS) Elements. This approach ensures full lifecycle development is being addressed at the beginning of the program.

The amount of capability implemented will be determined by funding, priorities, and authoritative engineering data received.

The Contractor shall configure the PLM System to meet the functional capability’s objective described in section 2.1, the key objective processes in section 2.2 and ensure that the system meets the Model Based System Engineering approach to software/system development.

The Contractor will work with the PMA-268 PLM Implementation Lead and the IPT Leads in the performance of the work detailed in this SOW. The requirements in sow are detailed by General Requirements that apply to all tasks and describe specific functionality.

# REFERENCES

## Specifications, Standards, and Handbooks

The Contractor will utilize the following standards in the performance of the work defined herein. The contractor or the government may recommend alternate standards including industry standards which may be used with concurrence from both.

## Other Government Documents, Drawings, and Publications

## Key PLM System Processes

The Contractor shall perform system processes per ISO/IEC/IEE: 15288:2015(E).

Software processes will include requirements management, software development and change management, software configuration and release management, software and system compliance, software metrics, hardware applicability and integration, and compliance reporting. Software development strategy and processes will be coordinated with PMA and may include Agile, traditional, or hybrid development processes. The Software Requirements and Software Configuration Management Process will be linked to all other relevant PMA-268 PLM processes.

The Contractor shall deliver the data standards, architecture, and schema for managing PMA-268 data across the lifecycle in accordance with Agile methodology.

# System KEY Objectives & Processes

The PLM system provides PMA 268 with a next-generation product data management system. It must enable greater access to and sharing of program product data in support of Integrated Product Teams (IPTs).

## PLM System Functionality Requirements

This section refers to requirements that pertain to all tasks in this SOW.

The amount of capability implemented will be determined by funding, priorities, and authoritative data received.

### Program Management

#### The contractor shall report Contractors Progress, Status and Management Report on a monthly basis. (CDRL A001)

#### The contractor shall develop and provide a System/Software Integration Plan that is aligned with Product Lifecycle Management (PLM) Plan for PMA-268 Unmanned Carrier Aviation (UCA) Program Office. (CDRL A002) The System/Software Integration Plan must identify all internal and external interfaces required to field the MQ-25 and maintain the configuration of all delivered BUNOs.

#### The contractor shall create and deliver an Integrated Program Management Report (IPMR) / IMS on a monthly basis. (CDRL A003) This IMS must align with the System/Software Integration Plan.

### Schedule Management

The PLM system is the product development process by enhancing productivity and creating a more effective environment to manage the entire program management defined business processes and achieve strategic program initiatives.

Examples of Program Management business processes are managing the program acquisition strategy development, Schedule Management, Risk Management, Contracts Action, Financial Management, and Staffing.

##### Schedule Generation

###### The PLM System shall generate a schedule based on Program Milestones.

###### The PLM System shall allow users to create schedules.

###### The PLM System shall store all Schedules for PMA-268.

###### The PLM System shall incorporate integration with the program scheduling plan.

##### Configuration Managed Schedule

###### The PLM System shall have a central repository for Program and Project schedules.

#### Risk Management

##### Risk, Issue and Opportunity (RIO) Data Storage

###### The PLM System shall have a central repository for RIO artifacts and briefs through the life of the program.

##### Risk Tool

###### The PLM System shall allow multiple participants to be able to update a single document and capture all individual comments for reviews as opposed to several versions that users individually update.

#### Contracts Action

##### Statement of Work (SOW, SOO, BOA) Generation

###### The PLM System shall have a central repository for RIO artifacts and briefs through the life of the program.

##### Statement of Work (SOW, SOO, BOA) Configuration Management

###### The PLM System shall allow multiple participants to be able to update a single document and capture all individual comments for reviews as opposed to several versions that users individually update.

##### Statement of Work (SOW, SOO, BOA) Storage

###### The PLM System shall store all Statement of Work (SOW, SOO, BOA, IDIQ, etc.) for the PMA-268 for the life of the program.

##### CDRL Generation

###### The PLM System will allow multiple participants to be able to generate a CDRL.

###### The PLM System shall allow CM or Leads to be able to generate a CDRL.

##### CDRL Configuration Management

###### The PLM System will allow multiple participants to be able to update a single CDRL and capture all individual comments for reviews as opposed to several versions that users individually update.

###### The PLM System shall allow multiple participants to be able to update a single 1423 and capture all individual comments for reviews as opposed to several versions that users individually update.

##### CDRL Storage

###### The PLM System shall store all CDRL data for the life of PMA-268 program.

##### Contracts Data Storage

###### The PLM System will store pertinent contract data. Unclassified contracts may be loaded into PLM and access restricted if desired. Classified contracts will not be in Stingray PLM.

###### The PLM System shall store pertinent contract data.

#### Financial Management

##### Financial Data Workbook Generation

###### The PLM System shall allow financial leads to upload a workbook that can be dispersed to all leads for updates via workflow.

##### Financial Data Workbook Configuration Manage

###### The PLM System shall allow all users to verify or update their Financial Data inputs in the same workbook for consolidation of comments that are integrated in one workbook.

##### Financial Data Workbook Data Storage

###### The PLM System shall store all Financial Data for the life of PMA-268 program.

#### Staffing

##### Staffing Data Workbook Generation

###### The PLM System shall allow staffing leads to upload a Staffing Data Workbook that can be dispersed to all leads for updates via workflow.

##### Staffing Data Workbook Configuration Management

###### The PLM System shall allow all users to verify or update their Staffing Data Workbook inputs in the same workbook for consolidation of comments that are integrated in one workbook.

##### Staffing Data Workbook Storage

###### The PLM System shall store all Staffing Data Workbooks for the life of PMA-268 program.

### Program Document Management (PDocM)

The PLM's Product Document Management is a set of processes and technologies that supports the collection, managing, and publishing of information in any form or medium. Once data is stored and accessed in the PLM system it is now considered Digital Content.

#### Product Document Repository

##### Acquisition Management (AQM) Documentation

###### The PLM System shall capture AQM artifacts via an AQM review workflow.

###### The PLM System shall allow reviewers to mark up a single document and keep the configuration of all comments for an AQM review.

###### The PLM System shall develop an AQM artifact review workflow that annotates all stakeholder comments in a central AQM Workbook.

###### The PLM System shall create an extract of all the AQM artifact comments.

##### Submittal Documentation

###### The PLM System shall generate submittals from CDRLs.

###### The PLM System shall capture Submittal artifacts via a Submittal review workflow.

###### The PLM System shall develop a Submittal Artifact review workflow that annotates all stakeholder comments in a central Submittal Workbook.

###### The PLM System shall allow for acceptance/acknowledgement of the CDRL Submittal workflow.

###### The PLM System shall allow for rejection of the CDRL Submittal.

###### The PLM System shall create a rejection letter for rejected Submittals.

#### Program Document Repository

###### The PLM System shall develop a Program Documentation Repository as the authoritative data and single source of truth for all program related data and documents.

##### Contract Documentation

###### The PLM System shall maintain Contracts Documentation and restrict access to privileged users.

###### The PLM System shall create a Contracts Object to collect the pertinent contract data needed to trace all CDRLs, Requirements, and associated data.

##### CDRL Documentation

###### The PLM System shall allow users to create CDRLs and Form 1423 extracts.

###### The PLM System shall maintain all CDRLs for the life of the program.

###### The PLM System shall maintain configuration of the official CDRLs.

###### The PLM System shall provide a workflow for CDRL to be routed for approval.

##### DIDs

###### The PLM system shall provide a library to store applicable contract DIDs and manage them. (The customer will work with ASSIST to determine if DIDs can be exported in a batch file for import)

##### DoD Policies

All DoD Policies used as references in the PMA-268 Program Documentation will be loaded into the PLM system for all references used by PMA-268 and associated organizations.

###### The PLM System shall store all DoD Policies that are applicable in each document DoD references.

##### Cybersecurity Plans & Artifacts

All PLM Cybersecurity artifacts need to be considered CUI (CTI) but open to all in accordance with the ATO Guidance.

###### The PLM System shall store all unclassified IATO, IATT, ATO, MFR and other accreditations packages for PMA-268.

###### The PLM System shall create all necessary artifacts for ATO compliance and make available to all users.

###### The PLM System shall store all PLM Cybersecurity Plans & Artifacts needed for PLM ATO accreditation.

### Product Data Management

The PLM's Content Management is a set of processes and technologies that supports the collection, managing, and publishing of information in any form or medium. Once data is stored and accessed in the PLM system it is now considered Digital Content.

#### Content Management Capabilities

The PLM's Content Management is a set of processes and technologies that supports the collection, managing, and publishing of information in any form or medium. Once data is stored and accessed in the PLM system it is now considered Digital Content.

##### Digital Workflows Management

The PLM System uses workflows to manage the day-to-day activities in the PLM. The PLM System will allow all repeatable activities that can be put in a workflow to standardize and outline workloads to products. Bottom line anything that we are routing today via paper should have an electronic workflow to eliminate emailing documents, etc. The PLM integrates with workflow management by issuing task alerts and notification. The program can collect metrics on tasking turnaround times, bottlenecks, and more efficient and distinct tasking. A single product change control process should be established that supports effective control of product changes and enables information about each change to be found easily

The PLM System shall provide an interface to create, change and retire Digital Workflows.

The PLM System shall allow any approved user to submit an artifact to a Digital Workflow.

The PLM System shall provide training for workflow development.

##### Business Process Management

The PLM Business Process Management is the identification, improvement and management of use cases, standard work processes, workload handoffs and any repeatable business process that can be automated to remove manual work.

###### The Stingray PLM process management shall optimize business processes.

###### The Stingray PLM shall capture stakeholder business process requirements.

###### The PLM System shall implement Business Processes Requirements into the SysML Model.

###### The PLM System shall perform any model and simulation activities to further define implementation success.

###### The Stingray PLM business process management shall develop, test and promote requirements and/or capability into PLM Production Environment.

###### The PLM System shall conduct continuous monitoring to determine if the business process requirements are optimized.

###### The PLM System shall continuously enhance and optimize our Business Processes if return on investment is sufficient.

###### The PLM system shall streamline the product development process by enhancing productivity and creating a more effective environment to manage the entire program management business processes and achieve strategic program initiatives.

##### Quality Management

The PLM Quality Management Principles ensures that an organization, product, or service is consistent. The PLM Quality Management focuses on ensuring the design and conformance to specifications are built into the design of the system.

###### The PLM System shall implement the Quality Management Principles.

##### SysML Models

The PLM SysML is a general-purpose graphical modeling language for specifying, analyzing, designing, and verifying complex systems that may include hardware, software, information, personnel, procedures, and facilities. The PLM uses Cameo™ SysML.

###### The PLM System shall be designed using Systems Modeling Language (SysML).

##### User Interface

The PLM User Interfaces (UI) defines the interface objects and actions that allow the user to perform all tasks that are defined in the user requirements.

###### The PLM System shall provide a common user interface.

###### The PLM System shall allow users to tailor their own homepages.

###### The PLM System shall be Common Access Card (CAC) enabled.

##### Enterprise Reporting

The N-PLM fulfills the Enterprise Reporting based on what the Resource Sponsor requires. The Stingray PLM will have metrics reporting and other required views. It is assumed that customers like OPNAV SECNAV will want metrics and reports at an enterprise level. Reports leveraging all main domains (pillars) to include internal and external DoD IT systems may be desired or required, which means that the PLM system will need to report out its data via an Interface Control Document to an external system. Flexibility in reporting and being able to develop emerging reports is required.

Provides drill-up/drill-down capability, by building dashboards or analytics capability. By selecting different hierarchies, the users of the system can view and analyze the same basic data from multiple perspectives based on their business needs.

###### The PLM System shall display enterprise reporting via interface to DECKPLATE and DECKPLATE Data Marts.

###### The PLM System shall report data and/or metrics to the Navy Product Lifecycle Management System via the ESB.

###### The DECKPLATE interface shall include all Maintenance Actions (MAF data); applicable supply data (DLA-FLIS, NAVSUP WSS& NERP); flight data-AIRRS (OPNAV 3710.x) and any other 3M data required from the COMNAVAIRFOR 4790.xx for MQ25.

###### The PLM System shall create necessary links and integration at the webpage level for DECKPLATE reports.

##### Dashboard View Across PMA

The Stingray PLM has dashboard capability for individuals to display on their homepages. The N-PLM will determine and make available Enterprise Dashboards based on program input to present reports, graphs and information in the form of metrics or executive dashboards or process dashboards

###### The PLM System shall provide dashboard capability view based on requirements captured from the program office.

##### Advanced Analytics (includes Big Data Analytics, Machine Learning, Artificial Intelligence, and Internet of Things)

Advanced Analytics is essential to Naval Aviation Readiness. Aircraft Readiness will increase because data confidence is high, and data is authoritative. The Advanced Analytics shall determine cost to maintain the Air Vehicle.

###### The PLM System shall provide Advanced Analytics capabilities either integrated into N-PLM, N-MRO, N-SCM or organic in the Stingray PLM.

###### The PLM System shall utilize Big Data Analytics, Machine Learning, Artificial Intelligence, and/or Internet of Things (IoT) to display the Advanced Analytics Capability.

#### Project Management Capabilities

The PLM system allows the users to manage a distinct project which is an endeavor with defined start and finish criteria undertaken to create a product or service in accordance with specified resources and requirements.

Examples of Projects are Ground Control Station (GCS), Air Vehicle and common and Peculiar Support Equipment (PSE).

##### Access Control/Management

Clear systemic overall ownership for all product data based on the PLM Roles & Responsibilities.

###### The PLM System shall manage access control to and within the Stingray PLM.

###### The PLM System shall provide a program for PMA-268 MQ-25 Product Data and another for Program Management Business Processes in Siemen's Teamcenter.

###### The PLM System shall create projects for Program Management, Air Vehicle, UMCS, Support Equipment and ancillary Integrated Product Teams (IPTs) for all product data.

###### The PLM System shall enable access to and sharing of program product data in support of Integrated Product Teams (IPTs).

###### The PLM system shall allow authorized users to access all PLM- managed resources with a single logon.

###### The PLM system shall allow the users to manage a distinct project which is an endeavor with defined start and finish criteria undertaken to create a product or service in accordance with specified resources and requirements.

##### Roles & Responsibilities

###### The PLM System shall assign each user their Roles and Responsibilities based on their required write access and need to know.

###### The PLM System shall assign the license bundle to every registered user.

##### Project & Task Management

###### The PLM System shall allow users to capture and display detailed program/project information.

###### The PLM System shall outline and link the program's organization, products, activities, phases, gates, standard activities, checklists, templates, deliverables, roles and responsibilities.

###### The PLM System shall be subdivided into projects and all linkages and relationships will be maintained and enforced by the PLM solutions.

##### Product Data Schedule Management

###### The PLM System shall create schedules based on contract and CDRL submittal dates.

##### Information Sharing

###### The PLM System shall conduct information sharing between People, Products, Processes and Systems.

#### Digital Data Management Capabilities

##### 3D Models & Visualization

The Navy has determined that 3D models of our assets has reduced costs, reduced waste, reduced turn-around-time for repairs and increased readiness. Stingray PLM will be the first PMA with a fully annotated 3D model of our aircraft by BuNo. 3D Models & Visualization is a set of tools and techniques to leverage model geometry, design data, and design attributes to perform studies, validation, and collaboration. Visualization capabilities enables the product lifecycle to access and collaborate on rich design data that they need to do their work. Increases productivity by allowing a user to find what you need faster, enabling to see the big picture so smarter decisions and providing you with seamless access to PLM

###### The PLM System shall upload, configuration manage, and display MQ-25, MDCS, SE, and ancillary fully detailed 3-D Models.

###### The PLM System shall provide ability to author, import, update, visualize, evaluate, collaborate upon, approve, and configure manage authoritative 2D Drawings and/or 3D Models and associative data (metadata).

##### Parts Management

For success, the Stingray PLM will capture, maintain and display authoritative data for parts management. This includes the logistics, engineering and management applied to parts.

###### The PLM System shall capture all parts details from authoritative sources (OEM, NAVSUP, DLA, FRC, DECKPLATE).

###### The PLM System shall fully manage the parts inventory and applicability against individual aircraft.

##### Approved Parts Lists (APL) and Approved Vendor Lists (AVL) APL/AVL

Robust management of APL/AVL provides integrated data to support sourcing strategies and part selection. Enables part standards, preferred parts and vendor management.

###### The PLM System shall provide integrated supply part and vendor information that is required to purchase or develop parts for aircraft readiness.

##### Bill of Material Management

The PLM has a central repository of product record information for BOM accessible by all teams on approved- access basis. Integrates with workflow management by issuing task alerts and notifications. Fully supported collaborative product design, supply, and manufacturing process.

###### The PLM System shall have a central repository for Bill of Materials to include engineering, supply, maintenance (eBOM, sBOM and mBOM).

##### Technical Data Management

The PLM stores all unclassified technical data to include Maintenance Plans, Interactive Electronic Technical Manuals (IETMs), Maintenance Data, Supply Data, Analysis Data, Models, 2D Drawings, Parts Lists, Inventories, Model Based Definitions, Object definitions, etc.

###### The PLM System shall store ALL unclassified technical data for PMA-268 for the life of the program.

###### **Maintenance Planning**

The PLM has the ability to build IETMs; but we already paid for EPS, so we would want to interface to that and only exchange the data needed.

The PLM System shall collect, manage, and store all Maintenance Plans and necessary associated data from the PMA-268 Logistics Product Data (LPD) required by stakeholders.

The PLM System shall interface with Enhanced Automated Graphical Logistics Environment (EAGLE ™) tool.

###### **Interactive Electronic Technical Manuals (IETM)**

The PLM has the ability to build out the -0007 standard; but we already paid for a LPD, so we would want to interface to that and only exchange the data needed.

The PLM System shall collect, manage, and store all source data for IETMs builds and necessary associated data from the PMA-268 LPD required by stakeholders.

The PLM System shall interface with EPS on user defined requirements.

###### **Supply**

Supply data is essential for readiness. PMA-268 authoritative data source for supply is NAVSUP and DLA. Supply is defining all the data elements we need to build out for supply buy plans.

The PLM System shall collect, manage and store all source data for asset management.

The PLM System shall interface with supply authoritative sources (DLA, NAVSUP).

The PLM System shall create the ability for supply personnel to plan out year buys, spares, etc.

###### **Publication/Manuals**

A cross repository that holds all reference publications and manuals ensures that all stakeholders can access the reference data within the PLM.

The PLM System shall maintain a repository that holds all relevant publication and manuals used on the PMA-268 program.

The PLM System shall utilize the S1000D SNS standard for Work Breakdowns; Work Unit Codes (WUC) and the NAVAIR.

#### Configuration Management Capabilities

##### Configuration Management of Product Data

Clear systemic overall ownership for all product data and all data from inception to retirement will be tracked, traced, metadata tagged and associated in a model-based systems engineering approach. Roles & Responsibilities will determine who owns the data, who can view, change, approve, release, and retire the data. This provides traceability access to the complete history of all manufactured/service serialized parts, spanning maintained and repair locations and depots The PLM System shall maintain configuration management of all program and product data.

###### The PLM System shall maintain configuration management of all program and product data.

###### The PLM System shall be the Configuration Managed source for all PMA-268 product data.

##### Change Management

Product change management is part of a PLM solution with full integration between document management and workflow management. Increased change management efficiency with repeatable processes and traceability

###### The PLM System shall maintain change management of all program and product data.

##### Engineering Change Proposal (ECP) Process

The ECP process allows any change to a baseline or configuration- managed end item through workflow management and it will automatically be linked to any/all associated data.

###### The PLM System shall develop or integrate the ECP Process.

##### Change Notification

Any changes that take place via user/owner, workflow, etc., will automatically notify subscription participants. It also is the primary alert mechanism for workflow task assignment and completions.

###### The PLM System shall fully integrated change notification as a core capability of a PLM.

##### Change Request

Fully integrated change request capability of a PLM will track any change requests submitted from a user/owner, workflow, etc., and will automatically notify subscription participants.

###### The PLM System shall fully integrated change request capability of the PLM System.

###### The PLM System shall track any change requests submitted from a user/owner, workflow, etc.

###### The PLM System shall automatically notify subscription participants of change request.

#### Product Reliability Management

Reliability, Availability, Maintainability and Cost are essential to the success of PMA-268. This data is core for supply purchases and readiness planning.

##### Reliability, Availability, Maintainability and Cost (RAM-C) Model integration

###### The PLM System shall integrate the RAM-C Model into the PLM.

##### Collaborative Product Structure Population

BOM compares becomes a forcing function of all TDP deliveries to ensure that the data received by Stingray PLM is the same as the source. Boeing will run the same report on their side for compliance of data accuracy and completeness.

###### The PLM System shall load Technical Data Packages (TDP) from Boeing via the Boeing secure file transfer protocol.

###### The PLM System shall receive Technical Data Package (TDP) from Lockheed Martin

###### The PLM System shall develop an engineering Bill of Material (eBOM).

###### The PLM System shall provide a way to extract the eBOM for air vehicle.

###### The PLM System shall provide a way to extract the eBOM for MDCS.

##### Requirements Management

It is essential that the Requirements for the program are uploaded into PLM for true traceability from the requirement to the delivered product and/or data. Requirements Management integrates business needs throughout the product lifecycle, on a secure platform. It enables efficient capture, management, and communication of requirements to everyone involved in development

###### The PLM System shall receive or link to all requirements received from the Program Office.

###### The PLM System shall load all baseline requirements received from the Program Office.

###### The PLM System shall link associated artifacts within the PLM that fulfill the Program Requirements.

###### The PLM System shall create a Requirements Traceability Matrix based on the requirements received.

##### Quality Management

The Stingray PLM process for ECPs will be looped back to design data. The Stingray PLM will assist users to create a strong root cause analysis.  The Stingray PLM will integrate with a formal ECP process, unless one does not exist; then ECP process will be created in Stingray PLM. The ECP process is fully closed loop corrective action tracking with integration to engineering change and issue tracking processes.  Automatic notification to all participants.

###### The PLM System shall incorporate quality management.

###### The PLM System shall create a single view of quality related information across multiple departments and locations based on user requirements.

###### The PLM System shall use the formal Engineering Change Proposal (ECP) for product quality issues.

###### The PLM System shall use configuration-controlled design data and stored artifacts to assist with engineering reviews and/or Engineering Change Proposals.

##### Customer/Supplier Issue Management

The Stingray PLM Help Desk support is aligned to the enterprise-wide system for tracking customer and supplier issues. The Stingray PLM will create workflow(s) that loop fielded product quality issues through a help desk support function that annotates the root cause analysis tools and automatically notifies all participants.

###### The PLM System shall incorporate a help desk support capability.

##### Partner Relationships

Partners will be clearly categorized depending on the type of collaboration (system supplier, module supplier, part supplier).

###### The PLM System shall support Collaboration and Partner relationships through workflow management, data interfaces and/or integration.

### System Integration Management

#### Manufacturing Execution System Integration

##### Manufacturing Execution System Integration

The Stingray PLM shall interface and/or integrates numerous data components with the external manufacturer's source systems.

###### The PLM System shall have a fully defined SysML Model that addresses the internal and external interfaces and/or integration to manufacturing systems using a Model Based Systems Engineering (MBSE) approach.

##### BOEING PLM to PMA-268 PLM Bi-directional

Boeing PLM and Stingray PLM will exchange data automatically for data that the program office has approved.

###### The PLM System shall have a Bi-Directional interface with the Boeing PLM.

##### Lockheed PLM/CAD to PMA-268 PLM

Lockheed PLM and Stingray PLM will exchange data automatically for data that the program office has approved.

###### The PLM System shall have a Bi-Directional interface with the Lockheed Martin PLM.

#### Maintenance Execution System Integration

Stingray PLM has a fully defined SysML Architecture for external interfaces to maintenance systems and data. N-MRO via ESB will integrate numerous Material and Maintenance data components for ingestion into the Stingray PLM System. For internal maintenance systems and data, the MBSE approach will be used to support the maintenance business process design.

##### Maintenance Execution System Integration

###### The PLM System shall integrate with Naval Maintenance Repair & Overhaul for all the Maintenance systems that affect the program baselines.

###### An ESB shall integrate numerous maintenance data components to ensure the Stingray PLM data exchange has the complete authoritative data for N-MRO.

##### N-MRO for Optimized-Organizational Maintenance Activity (OOMA) replacement (via ESB)

All maintenance data that is created in the fleet via the OOMA (N-MRO) System needs to flow up line to N-PLM and feed programs of record. An interface to N-PLM (N-MRO and N-SCM) will ensure all systems are kept in synch and exchange "O" Level maintenance data configuration changes.

###### The PLM System shall require authoritative PMA-268 "I" Level Repairable data from DECKPLATE and DECKPLATE Data Marts.

###### The DECKPLATE interface shall include all (Intermediate Level "I" Level) Maintenance Actions (MAF data); applicable supply data (DLA-FLIS, NAVSUP WSS& NERP); flight data-AIRRS (OPNAV 3710.x) and any other 3M data required from the COMNAVAIRFOR 4790.xx for MQ25.

###### The PLM System shall create necessary "O" Level links and integration at the webpage level for DECKPLATE.

##### N-MRO for OIMA replacement (via ESB)

All maintenance data that is created in the fleet via the OOMA (N-MRO) System has the ability flow up line to N-PLM and feed programs of record. An interface to N-PLM (N-MRO and N-SCM) will ensure all systems are kept in synch and exchange "O" Level maintenance data configuration changes. Single, up-to-date source of truth for product data.

###### The PLM System shall require authoritative PMA-268 "I" Level Repairable data from DECKPLATE and DECKPLATE Data Marts.

###### The DECKPLATE interface shall include all (Intermediate Level "I" Level) Maintenance Actions (MAF data); applicable supply data (DLA-FLIS, NAVSUP WSS& NERP); flight data-AIRRS (OPNAV 3710.x) and any other 3M data required from the COMNAVAIRFOR 4790.xx for MQ25.

###### The PLM System shall create necessary "I" Level links and integration at the webpage level for DECKPLATE.

##### N-MRO for Depot Level Repairable (via ESB)

The PLM System needs to interface with Organic Fleet Readiness Centers (FRCs) to ensure all maintenance, supply, aircraft and ground station inventories, Technical Data and Kits Management are current and up to date for D level Maintenance. This interface needs be 2-way to ensure we do not lose control of custody. The Stingray PLM will have integrated workflows for digital data movement of the baseline from the Stingray PLM to the Organic FRCs.

###### The PLM System shall require authoritative PMA-268 maintenance data from N-MRO for DEPOT Level Repairable status from Organic Depots.

###### The N-MRO interface shall include all Depot Level Repairable & Organic Maintenance Actions (MAF data); applicable supply data (DLA-FLIS, NAVSUP WSS& NERP); and any other 3M data required from the COMNAVAIRFOR 4790.xx for MQ25 for Depot level Maintenance.

##### N-MRO Interface to DECKPLATE (via ESB)

The PLM System needs to interface with DECKPLATE via N-MRO data feed via the ESB extract from N-MRO.

###### The PLM System shall require authoritative PMA-268 maintenance data (required by the NAMP) from DECKPLATE and DECKPLATE Data Marts.

###### **DECKPLATE Aviation Management Supply and Readiness Reporting (AMSRR) Interface (Maintenance 1-5)**

The PLM System needs to interface with DECKPLATE DataMart for AMSRR Data via ESB extract from N-MRO. The PLM System will interface with DECKPLATE DataMart for Maintenance 1-5 Reports (Standard Readiness Metrics) via ESB extract from N-MRO.

The PLM System shall require authoritative PMA-268 data from DECKPLATE DataMart for AMSRR Data and Maint 1-5 Reports.

###### **TDKIT DataMart**

The PLM System will interface with DECKPLATE DataMart for DECKPLATE DataMart DECK-TDKITS for Technical Data Status Accounting (TDSA) and KIT Management (KITMIS) Data via ESB extract from N-MRO.

The PLM System shall require authoritative PMA-268 data from DECKPLATE DataMart DECK-TDKITS for Technical Data Status Accounting (TDSA) and KIT Management (KITMIS).

###### **DECKETR DataMart**

The PLM System will interface with DECKPLATE DataMart for DECKPLATE DataMart DECK-ETR for Engine Management Data via ESB extract from N-MRO.

The PLM System shall require authoritative PMA-268 data from DECKPLATE DataMart DECK-ETR for Engine Management.

###### **AIRRS DataMart**

The PLM System will interface with DECKPLATE DataMart DECK-AIRRS for Aircraft Inventory Readiness Reporting (AIRRS) Data via ESB extract from N-MRO.

The PLM System shall require authoritative PMA-268 data from DECKPLATE DataMart DECK-AIRRS for Aircraft Inventory Readiness Reporting (AIRRS) Data.

###### **DECK-ALS Auto Log Sets**

The PLM System will interface with DECKPLATE DataMart DECK-ALS for Automated Log Sets Data via ESB extract from N-MRO.

The PLM System shall require authoritative PMA-268 data from DECKPLATE DataMart DECK-ALS for Automated Log Sets Data which captures all the logs and records that accompany an aircraft (Health Record Cards (HRC), etc.).

#### Supply Executing System Integration

##### Supply System Integration

The PLM System needs to interface with N-SCM system for all needed authoritative supply & cost data for PMA-268 by having a complete data extract from N-SCM via the ESB. The PLM System will initially offer webpage links from the Stingray PLM Homepages.

###### The PLM System shall tintegrate with Naval Supply Chain Management for PMA-268 authoritative supply & cost data that affect the program baselines.

###### An ESB shall integrate numerous supply data components to ensure the Stingray PLM supply data exchange has the complete authoritative data from N-SCM.

##### N-SCM for N-ERP ADS Supply and Cost Data

The PLM System needs to interface with N-SCM system for all needed authoritative supply & cost data for PMA-268 by having a complete extract of all N-ERP from N-SCM via the ESB.

###### The PLM System shall require authoritative PMA-268 N-ERP supply & cost data via N-SCM.

###### The PLM System shall integrate N-ERP authoritative supply and cost data into the RAM-C.

##### N-SCM for NAVSUP/WSS ADS Supply Cost Data

The PLM System needs to interface with N-SCM system for all needed authoritative supply & cost data for PMA-268 by having a complete extract of all NAVSUP's WSS from N-SCM via the ESB.

###### The PLM System shall require authoritative PMA-268 NAVSUP WSS supply & cost data via N-SCM.

###### The PLM System shall integrate NAVSUP's WSS authoritative supply and cost data into the RAM-C.

##### N-SCM for DLA/FLIS ADS Supply Cost Data

The PLM System needs to interface with N-SCM system for all needed authoritative supply & cost data for PMA-268 by having a complete extract of all DLA's FLIS from N-SCM via the ESB.

###### The PLM System shall require authoritative PMA-268 DLA's FLIS supply & cost data via N-SCM.

###### The PLM System shall integrate DLA's FLIS authoritative supply and cost data into the RAM-C.

##### N-SCM Interface to N-MRO (via ESB)

The PLM System needs to ensure that all supply and cost data for PMA-268 identifies the authoritative source to eliminate duplicate or inaccurate data.

###### The PLM System shall require authoritative PMA-268 N-MRO supply and cost data via N-SCM.

##### N-SCM Interface to N-PLM (via ESB)

The PLM System will ensure that all supply and cost data for PMA-268 identifies the authoritative data source to eliminate duplicate or inaccurate data. Increased parts reuse and decreased data duplication.

###### The PLM System shall require authoritative PMA-268 N-PLM supply and cost data via N-SCM.

#### Engineering System Integration

##### In-Service Engineering System Integration

The PLM System will interface with in-service engineering systems that manage all disciplines of in-service engineering.

###### The PLM System shall integrate with In-Service Engineering Systems for PMA-268 authoritative In-Service Engineering data that affect the program baselines.

###### An ESB shall integrate numerous in-service engineering data components to ensure the Stingray PLM has the complete authoritative in-service engineering data from N-MRO.

##### JTDI Integration

The PLM System will interface with JTDI for all capabilities described in the JTDI OV-1.

###### The PLM System shall integrate to JTDI, and all of its internal capabilities described in the JTDI OV-1.

##### JTDI Weapon System Website Health Usage and Monitoring Status (HUMS) Data

The PLM System will interface with JTDI Weapon System Website for all HUMS and raw flight data.

###### The PLM System shall interface with the Weapons System Website for all HUMS Data in the Standard Data Repository (SDR) located at the Joint Technical Data Information (JTDI) Top Tier.

###### The SDR shall capture and maintain all raw and/or translated HUMS.

##### JDMS Transportation Mechanism

##### The PLM System will use the JDMS Transportation mechanism to move data in the N-PLM, N-MRO and N-SCM.

###### The PLM System shall utilize the JDMS (Joint Data Messaging System) to move HUMS data from the NFSA Mid-tier Rack to the Standard Data Repository (SDR) via the JTDI Top Tier Weapons System Website for all HUMS Data.

###### The JTDI Top Tier shall capture and maintain all raw and/or translated HUMS.

##### SDR Integration to the PLM

JDMS will transport data from the fleet to the Standard Data Repository. Transportation mechanism to move data in the N-PLM, N-MRO and N-SCM.

###### The PMA-268 Program office shall define all Standard Data Repository (SDR) requirements.

###### The PLM System shall integrate with the SDR.

##### Supplier Collaboration

To have a fully interfaced system with Boeing and Lockheed and/or other vendors.  The interface will be 2- way based on the requirements.

###### The PLM System shall integrate supplier collaboration.

###### The PLM System shall interface with Boeing for all CDRLs, Models, and delivered or exchange data.

##### Technical Data Exchange

The Stingray PLM shall exchange or collaborate on Technical Data to include 2D drawings to 3D models. The Stingray PLM shall integrate with Boeing PLM.

###### The PLM System shall exchange or collaborate on Technical Data to include 2D drawings to 3D models.

###### The PLM System shall integrate with Boeing PLM.

###### The PLM System shall collect requirements for all data exchanges with OEMs.

###### The PLM System shall implement an electronic exchange of technical data.

###### The PLM System shall interface with OEM PLM Systems.

##### Collaboration Process

The goal is to actively collaborate with partners in the PLM system and have workflows that may span multiple PLMs.

###### The Stingray PLM Partners shall have access to all their relevant product data via PLM/CAD.

###### The PLM System shall grant access to collaborative partners when participating in design reviews, engineering change management & full information sharing.

###### The PLM System shall provide common workflow- enabled processes that span both organizations.

##### Report Automation

All standard reports like milestone status and cost status are automatically generated by a PLM or Business Interface system. An aggregated monitoring view (metrics instrument panel) is provided by an external application or internal PLM Module in real-time.

###### The PLM System shall create automated supplier collaboration reports for stakeholders based on requirements.

#### Quality Management Integration

##### Quality Management Integration

Quality Management Principles – ensures that an organization, product, or service is consistent. Quality Management is focused not just on product and service quality, but also on the means to achieve it.

###### The PLM System shall implement Quality Management System Integration capability through workflows and metrics.

###### The PLM System shall integrate Quality Management Principles to ensure we have a continuously improving process.

##### PMA-268 Requirements Management System

PLM Requirements Management includes asset performance, compliance, quality, and service life and is essential for the closed-loop interaction between engineering, manufacturing, and product support

###### The PLM System shall capture high-level Requirement Management System requirements.

###### The PLM System shall obtain, store, retrieve, and create requirements matrix for Air Vehicle.

###### The PLM System shall obtain, store, retrieve, and create requirements matrix for Air Vehicle Ground Station.

##### Splunk Security System Integration

The Stingray PLM will use Splunk for Security Compliance and Event Management.

###### The PLM System shall integrate with the Splunk system for Security Information and Event Management (SIEM).

###### The PLM System shall use Splunk for all system security monitoring, advanced threat detection, incident investigations and forensics, incident response, Source of Code automation and wide range of security analytics and operations use cases.

##### Cameo PLM System Model

The Stingray PLM uses Cameo with SysML (Systems Modeling Language).

###### The PLM System shall utilize Cameo for PMA-268 Stingray SysML Modeling.

###### The PLM Digital System Model shall define the complete architecture for the Stingray PLM.

###### The DSM shall integrate with Siemen's Teamcenter™ software.

###### A Model-Based System Engineering (MBSE) approach shall be used to develop the framework for the PLM System.

##### Deficiency Reporting

Currently Joint Deficiency Reporting System (JDRS) is being used in the fleet by legacy platforms. MQ-25 will incorporate the enterprise solution for Deficiency reporting to include ECP, Engineering Change Requests (ECRs) and publication changes.

##### Support Equipment Records Management Information System (SERMIS)

Stingray PLM will link, interface or integrate with SERMIS based on the Support equipment requirements for the MQ-25.

### Application Integration Management

#### Manufacturing Application Integration

##### Boeing Application Integration

There are currently no known Boeing applications that PMA-268 needs to integrate with.

###### The PLM System shall integrate with Boeing Applications that are defined in the requirements from the Program Office.

##### Lockheed Martin Application Integration

There are currently no known Lockheed applications that PMA-268 needs to integrate with.

###### The PLM System shall integrate with Lockheed Martin Applications that are defined in the requirements from the Program Office.

#### Maintenance Application Integration

##### Maintenance Application Integration

There are several logistics IT applications that the Stingray PLM will need to integrate with (e.g., ALE, N-PLM, N-MRO and N-SCM.)

###### The PLM System shall integrate or link with program of record application for authoritative data and standard metrics.

##### Vector – ALE

Vector is a web-based tool that provides the Naval Aviation Enterprise the capability to drill down multiple levels to component level to help identify readiness impacts. When using the predictive feature of this tool, in conjunction with partnering with NAVSUP and DLA.

###### The PLM System shall integrate with the NAVAIR Vector Model for the Air Vehicle and Air Vehicle Ground Station data required by the PMA-268 Stakeholders.

#### Project Management Tool Integration

##### COGNOS -ALE

DECKPLAE Maint 1-5 Reports are enterprise reports across all TMSs. These reports include NAMP Reporting requirements.

###### The PLM System shall integrate or link with the DECKPLATE Maintenance 1-5 Reports for the Air Vehicle and Air Vehicle Ground Station data required by the PMA-268 Stakeholders.

###### The PLM System shall integrate with DECKPLATE's Cognos™ Maint -1 Consolidated Performance Metrics as defined in the Maint 1 DECKPLATE Report Performance Requirements.

###### The PLM System shall integrate with DECKPLATE's Cognos Maint -2 Configuration Management Engine Configuration as defined in the Maint 2 DECKPLATE Reports Configuration Data Report Requirements.

###### The PLM System shall integrate with DECKPLATE's Cognos Maint -3 DECKPLATE Aircraft Readiness Degradation and Utilization Summary Reports as defined in the Maint 3 DECKPLATE Reports Readiness Report Requirements.

###### The PLM System shall integrate with DECKPLATE's Cognos Maint -4 Activity SerNo Inventory as defined in the Maint 4 DECKPLATE Reports Activity SerNo Inventory report requirements.

###### The PLM System shall integrate with DECKPLATE's Cognos Maint -5 Configuration Management Aircraft Inventory as defined in the Maint 5 DECKPLATE Reports Activity Inventory report requirements.

##### National Center for Manufacturing Sciences (NCMS)/Hadoop -ALE

The NCMS is conjunction with SAS is being used today by DiATA group to see all their unstructured as well as structured data to do heavy analytics against. We need to create a requirement to have Stingray PLM data replicated to this area as well.

###### The PLM System shall integrate or link to NAVAIR's NCMS CBM+ Capability.

###### The PLM System shall integrate or link to the NCMS system which is built off a NAVAIR Hadoop Cluster Farm.

##### eCBM+ -ALE

Enterprise CBM+ capability is being led by DiATA group (old 6.8).  They have the infrastructure set up and the tools in place for individuals to go in and do heavy analytics if they know the tools.

###### The PLM System shall integrate or link with NCMS System for Enterprise Condition Based Maintenance Plus (CBM+) Interoperability.

###### The PLM System shall interface, integrate or link to any authoritative data source identified for CBM+ capability.

##### C-FRACAS – ALE

The primary reason to use FRACAS methodologies is to promote/improve the reliability and maintainability of a system. FRACAS provides a disciplined closed-loop process for solving reliability and maintainability issues at the design, development, production, and fielding phases of the life cycle of a system.

###### The PLM System shall interface, integrate and/or link to the approved Failure Reporting, Analysis, and Corrective Action System (FRACAS).

##### Project Management Tool Integration

The PLM System will ensure that project management tools used by PMA-268, have a requirement to be interfaced, integrated and/or linked with Stingray PLM, and what priority that PMA requirements receive. The PLM System ensures a systematic, secure, and repeatable integrated solution which enables easy capture, verification, and maintenance of requirements across the entire lifecycle

###### The PLM System shall interface, integrate and/or link to Project Management Tools in use by PMA-268.

##### Opus (API for N-PLM or MBPS or AvPLM?)

Opus Suite consists of three integrated products: OPUS10, SIMLOX and CATLOC. Together, they give the ability to predict and analyze the performance and costs of technical systems and their support solution from a life cycle perspective, both from a high-level system perspective and with a detailed in-depth view. Opus Suite supports decision-making with regards to requirements specification, acquisition of systems, design of logistics support solution, investment in logistic support resources and spares, or just continuous improvements of efficiency and operations.

###### The PLM System shall interface, integrate and/or link to the LPD build in Eagle for PMA-268. The Stingray LPD is built with the EAGLE Tool.

#### Quality Integration

##### The PLM System shall integrate Quality Management Principles to the application integration Level of the program.

##### EAGLE - LPD Database

EAGLE LSA is an enhanced LSAR (Logistic Support Analysis Record) relational database based on and fully compatible with the now cancelled MIL-STD-1388-2B and MIL-PRF-49506, as well as GEIA/TechAmerica-0007 and DEF STAN 00-60. It provides a complete Logistics Support Analysis architecture and goes beyond the specifications by adding tools to manage engineering drawings, technical manuals, video, and other functions.

###### The PLM System shall interface, integrate and/or link to the Raytheon's Enhanced Automated Graphical Logistics Environment (EAGLE) ™ LSA Database used to build and maintain logistic data and produce PMA-268 reports.

##### EPS - IETMs develop/products

Technical manuals are produced with EAGLE Publishing System and fielded systems are supported through operations and maintenance.

###### The PLM System shall interface, integrate and/or link to the Electronic Publication System (EPS) system which is part of the EAGLE LSA for all LSA is used for building and maintaining logistics data and producing PMA-268 reports.

##### SDR – ALE

Standard Data Repository (SDR) is all the data that we get from the fleet and move via NFSA with JDMS to the top tier of JTDI.

###### The PLM System shall have a Standard Data Repository (SDR) for all raw and processed health, usage, and monitoring (HUMS) data.

###### The PLM System shall have a folder structure in the SDR that is created with Program Management requirements.

##### Design Tool Integration (Vis Mockup)

Vis Mockup is a viewing tool that will be integrated into the PLM for full 2D & 3D viewing, mark-up, and saving. Vis Mockup also allows the ability to do digital mock-ups and virtual builds from 3D models.

###### The PLM System shall integrate the Vis Mockup capability to allow users to view the entire aircraft model with all the CAD details integrated.

##### HMCM

The NAVSUP HMCM Tool allows you to view and obtain HAZMAT. This will allow for visibility and tracking for site AUL, material requests, and inventory accuracy processes.

###### The PLM System shall display, interface and/or link to the PMA-268's Hazardous Material Control Management (HMCM) Tool.

###### The PLM System shall link to NAVSUP's HAZMAT Management and the Vis Mockup capability to allow users to view the entire aircraft model with all the CAD details integrated.

##### Enterprise/Program Reporting

It is assumed that customers like Office of the Chief of Naval Operations (OPNAV) SECNAV will want metrics and reports at an enterprise level. Reports leveraging all main domains (pillars) to include internal and external DoD IT systems may be desired or required, which means that the PLM system will need to report out its data via an Interface Control Document to an external system.

###### The PLM System shall integrate with Navy PLM for all enterprise reporting.

###### The PLM System shall use existing systems that report enterprise metrics (Example Maint 1-5 Reports in DECKPLATE).

###### Additional Enterprise/Program Reporting shall be defined by the stakeholder.

##### Dashboard View Across Program/Project

Program and Project Dashboards are used to identify, display, update, manage and retire logistic products data, tools and reports for the life of the program.

###### The PLM System shall display Dashboard views and make them tailorable on the Active Workspace Pages of the Stingray PLM.

##### Requirements Management Application (DOORS)

Requirements are managed in a PLM system with links to product structure, specifications and associated supporting data (market research material, technical papers, etc.) and include workflows to manage the changing requirements. For PMA-268, the PLM must be able to interface or take over requirements management functionality.

###### The PLM System shall capture all requirements identified by the Program Office.

###### The PLM System shall incorporate requirements based on capability.

###### The PLM System shall interface with Requirement Management Software or System to ensure 100% requirements capture.

###### **Collection Process**

###### The requirements collection follows a defined process which is enforced by an application.

The PLM System shall create processes for collecting requirements.

###### **Structuring**

###### The structuring and classification of requirements is supported by dedicated functionality. It allows multiple filter/search capabilities. It can group and build hierarchies and relationships between requirements.

The PLM System shall capture the requirement structure and hierarchy to adequately show requirement relationships.

###### **Requirements Traceability**

###### As part of the quality management capability automated compliant management and defect tracking mechanism is a function. Problems are easily traced back to product design/component/vendor via automated tools. Linkage back to change management process is automated and well connected to PLM processes.

The PLM System shall create a requirement's matrix of all requirements and where those requirements exist or affect the entire system.

##### Data Accuracy

Item descriptions are consistent across systems. Descriptions have sufficient detail for product recognition and search. Item attribution provides ability to search with accuracy.

###### The PLM System shall develop and maintain data accuracy throughout the life of the program.

###### The PLM System shall be the authoritative data source for the PMA-268 Configuration Air Vehicle and Air Vehicle Ground Station.

##### Splunk Application Integration

The Stingray PLM will use Splunk for Security Compliance and Event Management.

###### The PLM System shall integrate with the Splunk application for Security Information and Event Management (SIEM).

###### The PLM System shall use Splunk for all application security monitoring, advanced threat detection, incident investigations and forensics, incident response, Source of Code automation and wide range of security analytics and operations use cases.

##### Stingray PLM ATO

The original Stingray PLM Accreditation was complete on June 15, 2021. This give PMA-268 the authority to store and manage our approved IT System and data in the Government Cloud.

###### The PLM System shall maintain an Authority to Operate (ATO) for 3 years at an Information Level 5 (IL5).

##### Stingray PLM MFR

MFRs will be required every time we have a major IT change to our Stingray PLM baseline.

###### The PLM System shall submit MFRs for any major change to the configuration of the Stingray PLM ATO Package. Phase II of the Cloud Buildout is for the Test and QA environments and will require an MFR package.

### Infrastructure Management

#### Cloud Architecture

##### PMA-268 AWS IL5 ATO Package

This includes all the work required to receive an ATO, all the artifacts and certification.

###### The Stingray PLM shall create all necessary ATO Artifacts. And receive an authority to operate (ATO) for IL5 in the AWS Cloud.

##### PMA-268 AWS MFR Package

This includes all the work required to receive an MFR for the QA and Test environments. This will be an update to the ATO package.

###### The Stingray PLM shall create all the necessary artifacts based on any configuration change to our ATO. The Stingray PLM shall create and/or update cybersecurity controls based on configuration changes.

##### DNA Cloud Broker Integration (POAM)

This POAM will be maintained by the Stingray PLM Project Lead.

###### The Stingray PLM shall have an integrated POA&M for the Cloud Broker and customer requirements to build out the Cloud environments in Amazon Web Services GovCloud Solution.

#### Cybersecurity

The PLM System will adhere to all cybersecurity requirements required for an IL5 ATO in the AWS GovCloud.

##### Cybersecurity

###### The Stingray PLM shall adhere to all Cybersecurity Requirements.

###### The Stingray PLM shall maintain their Stingray PLM ATO Package Status.

##### Cybersecurity Artifacts Updates

The Cybersecurity Artifacts shall be uploaded into a place that all users can access.

###### The Stingray PLM shall maintain and update all the Stingray PLM ATO Artifacts.

##### ACAS Scans

###### The Stingray PLM requires quarterly and other required times to ensure Cybersecurity Scans are screened for vulnerabilities. The Stingray PLM shall scan and fix all ACAS vulnerabilities.

##### STIGs

All STIGs must be applied and re-scanned to ensure vulnerability has been fixed. All reporting sent to CyberCom.

###### The Stingray PLM shall require STIGs be applied to all applications and systems to ensure Cybersecurity Compliance.

##### Splunk Automation

Splunk Automation is how PMA-268 Stingray PLM is automating and reporting compliance for their ATO Package.

###### The Stingray PLM shall use our Splunk integration to automatically report security issues and fixes. The Stingray PLM shall use Splunk to help with Help Desk integration.

##### Disaster Recovery/COOP

The plan for cut over in case of natural or man-made disaster to the AWS GovCloud East. The Cloud has built in redundancy and COOP.

###### The Stingray PLM shall have Disaster Recovery and COOP built into their Cloud Architecture through the NAVAIR Cloud Broker.

#### Infrastructure Configuration Management

##### Hardware

###### The Stingray PLM shall maintain a current Hardware List at all times.

##### Software

###### The Stingray PLM shall maintain a current Software List at all times.

##### ACLs

The ACLs grant access and other rights by project, group, or role.

###### The Stingray PLM shall maintain and manage all ACLs for the Stingray PLM System.

##### Stylesheets

The Stylesheets define the user interface and can be global, group, or role defined. The stylesheets can also support Rich Access Client and/or Active workspace.

###### The Stingray PLM shall maintain and manage all Stylesheets used in Teamcenter to display how pages should look. BMIDE for and any data validation to the fields that is required.

##### BMIDE Model Updates

The BMIDE is required to ensure that Stingray PLM Model updates are reflected in Stingray PLM database.

###### The Stingray PLM shall maintain and manage all BMIDE Model Updates with any and all changes made to the Stingray PLM baseline.

#### External View

##### External View

The Stingray PLM has the ability to show external views of data.

###### The Stingray PLM shall view external application and system via interfacing or link.

# PMA-268 PLM Development, MAINTENANCE& Tasking

## PLM User Chart Example

The following is an example of some of the PLM User /Roles that may be used in the PLM.

|  |  |
| --- | --- |
| Group | Role |
| Configuration Management | CM/DM Approver |
| Configuration Management | CM/DM User |
|  |
| Contracts | Contracts Approver |  |
|  |
|  |
| Contracts | Contracts User |  |
|  |
|  |
| Engineering | CAD User |  |
| Engineering | Engineering Approver |  |
| Engineering | Engineering User |  |
| Engineering | Requirements User |  |
|  |
| Engineering | Systems Engineering Approver |  |
|  |
|  |
| Engineering | Systems Engineering User |  |
|  |
| Logistics | Logistics Approver |  |
| Logistics | Logistics User |  |
| Program Management | Leadership Approver |  |
| Program Management | Operations User |  |
| Roles | Approver |  |
| Roles | User |  |
| System Administration | Project Administrator |  |
| System Administration | Teamcenter Administrator |  |

Table 1 Roles & Responsibilities Example

## Performance Requirements

### PMA-268 IPT Organizational Chart

This SOW is broken into separate tasks to align with the development of the MQ-25 Program, major systems and subsystems. The contractor will be expected to work with multiple stakeholders to include vendors, OEM(s), NAVAIR personnel internal and external to PMA-268. It is also essential that the contractor be engaged in all the PMA-268 IPTs.

The PLM System falls under the Air System Development IPT Lead. However, a need to understand the entire organization is important to show the scope of the work. Product Data, Business Process, Work processes, etc. will be created, viewed, changed, approved and stored from various parts of the organization.

## Engineering Change Proposal through Supplier Portal

5.3.1 The Contractor shall implement DD form 1692.

(http://www.dtic.mil/whs/directives/forms/index.htm) in the electronic submission of ECPs. The portal must collect the data required on this form.

5.3.2 The PLM System must be configured to have the capability to generate hard copies of the 1692 in its currently approved form for records retention and potential routing through E-Power. More information on this process can be found in DI-SESS-80639D (http://quicksearch.dla.mil/) and the documents referenced therein.

5.3.3 The Contractor shall perform internal quality control in the development and updating of the PLM System, baseline configurations for aircraft, systems, subsystems, assemblies, curriculum, maintenance aide and integration of systems within the PLM system.

This is to ensure that if an ECP or new engineering release is input into the system that it does not inadvertently break another area. This is the true sense of the term quality control from an IT perspective.

## PLM Development & Configuration Management

PLM tools allow for a wide range of configuration and customization without the generation of custom code. Utilizing Siemen’s Teamcenter™ as a Commercial off the Shelf (COTS) solution in order to minimize cost of maintenance and future upgrades, custom software development will only be performed where necessary as approved by the TPOC.

5.4.1 The Contractor shall ensure they capture and report the metadata associated with the technical information needed to populate, update, interface, manage and configure control all associated product data. The following metadata fields are required at a minimum:

5.4.1.1 3D Application Name shall be metadata in the Teamcenter™.

5.4.1.2 Version of Application shall be metadata in the Teamcenter™.

5.4.1.3 3D Services shall be metadata in the Teamcenter™. Example of which services can be housed on standalone (virtual or physical) servers and which can cohabitate with other services and why?

5.4.1.4 The Contractor shall provide list of subordinate applications and or packages that are required to be installed on the server in order to install and run the 3D services.

5.4.1.4 The Contractor shall provide all Ports used by each service.

5.4.1.5 The Contractor shall provide Protocols used by each service.

5.4.1.6 The Contractor shall provide Application Users (service accounts that need to be added to a server).

5.4.1.7 The Contractors shall provide a list of services that require a URL.

5.4.1.8 The Contractor shall provide Installation Guides for the PLM applications for the version of the Operating System Installation/configuration requirements for the required application server.

5.4.1.9 The Contractor shall provide Configuration Guides for the 3D applications.

5.4.1.10 The Contractor shall provide Troubleshooting Guides for known issues and fixes.

5.4.1.11 The Contractor shall provide all Application security lockdown configurations.

## Sustainment

5.5.1 The contractor shall maintain and manage all existing Stingray PLM capabilities and provide BMIDE Model Updates with any and all changes made to the Stingray PLM production capabilities.

## PLM System Training

5.6.1 The Contractor shall create the training curriculum for each task order and update the Master Training Curriculum as a final deliverable.

This deliverable will include an introduction to the PLM tool for all, and user focused role-based training aligned with capability deployments. Training will be built with user objectives in mind addressing who is involved and what they are doing. As PLM tools have a wide range of capability above and beyond the specific needs listed in this contract, the training material will work to build associations over time, to encourage user confidence in the tool enabling them to go beyond the script. (CDRL A006)

5.6.2 The Contractor shall create training materials which are aligned to the capability throughout the development. (CDRL A006)

An outline of the training material will be generated from the PLM DSM (CDRL A004), to align the development efforts. The data types, workflow use cases, and high-level activities will be products of the DSM. This will ensure the training is in sync with the PLM deployment and can be updated/provided when changes are deployed in the production environment.

5.6.3 The Contractor shall develop and provide PMA-specific training for PLM use for all implemented processes and workflows.

Training may be a combination of classroom, online, guidebook approaches. Basic PLM functionality will be introduced through classroom training. User specific role-based training will be hosted on the PLM tool with additional access, log-in, and help information being provided in an externally accessible guide. The extent of training development will be determined by funding and priorities. User role-based training will be scripted from the DSM to include basic PowerPoint descriptions of steps in workflows and may be extended in multi-media context-based training material.

5.6.4 The Contractor shall develop training curriculum for each end item product or distinct workflow. (A006)

5.6.5 The Contractor shall provide recommendations and an entry for PMA training in the IMS. (CDRL A003)

5.6.6 The training curriculum shall allow the program office to train on the PLM system without additional Contractor Support. (A006)

## SECURITY

5.6.1 The Contractor shall implement and maintain security procedures and controls to prevent unauthorized disclosure of controlled unclassified information and to control distribution of controlled unclassified information in accordance with DoD 5220.22-M Change 2, National Industrial Security Program Operating Manual (NISPOM).

5.6.2 The Contractor shall implement and maintain security procedures and controls to prevent unauthorized disclosure of controlled unclassified information and to control distribution of controlled unclassified information in accordance with DoDM 5200.01, DoD Information Security Program.

5.6.3 The Contractor shall implement and maintain security procedures and controls to prevent unauthorized disclosure of controlled unclassified information and to control distribution of controlled unclassified information in accordance with SECNAV M-5510.36, Department of the Navy Information Security Program.

5.6.4 The Contractor shall implement and maintain security procedures and controls to prevent unauthorized disclosure of controlled unclassified information and to control distribution of controlled unclassified information in accordance with Manual and other applicable security classification guides and security regulations.

5.6.5 All Contractor facilities shall provide an appropriate means of storage for controlled unclassified information and materials.

5.6.6 All controlled unclassified information shall be appropriately identified and marked in accordance with DoDM 5200.01, Information Security Program: Controlled Unclassified Information (CUI) Volume 4.

5.6.7 All controlled unclassified information shall be appropriately identified and marked in accordance with DoD 5400.7-R (Freedom of Information Act Regulation) (Chapter 3).

5.6.8 For Official Use Only information generated and/or provided under this contract shall be marked and safeguarded, such as encrypted in an email.

5.6.9 The Contractor shall provide a PLM Operational Security Plan (CDRL A005) to ensure all security measures have been addressed for work performed under this contract.

### IT Cybersecurity

5.6.10.1 Any tools, software, systems developed by the contractor that will be hosted on Navy or DoD networks, or run on Navy or DoD IT systems shall comply with all required policy and processes identified in Section 1.1.

All Information Technology Systems or software/application development, modification or support performed by the contractor will be in accordance with the Defense Business Transformation guidance. This effort will make every effort to utilize the Cloud First Policy signed by the CNO.

5.6.10.2 The Contractor shall provide recommendations to ensure that all Cyber Security Compliance is maintained and incorporated for the PLM system.

5.6.10.3 The Contractor shall assist with the creation of a PLM Cybersecurity Strategy & Cloud Implementation Plan related to the PLM system.

5.6.10.4 Approved contractor-owned equipment and/or cloud services shall be permitted connections to NAVAIR/DoD networks to carry out the performance of this contract.

The following specific criteria must be met before any contractor IT can be connected to any DoD or NAVAIR network in support of this contract. Requirements include:

#### 5.6.2 Contractor Networks and Connections

Contractor-owned and operated infrastructures are allowed under this contract as is the use of commercial cloud computing strategy to expedite the fielding of the MQ-25 program under MACO.

5.6.2.11 The contractor may access non-government, external IP space via the NAVAIR-provided Virtual Private Network (VPN) Outreach service or NAVAIR CIO approved Internet Protocol (IP) service.

#### 5.6.3 Architecture Compliance

5.6.3.1 The Contractor shall provide recommendations to ensure all IT solutions, including database solutions, comply with the appropriate NAE Enterprise Architecture, and are verified by the NAVAIR Enterprise Architect (AIR-7.2.3).

5.6.3.2 The Contractor shall support network and IT updates to the PLM system and ensure consistent compliance with Risk Management Framework (RMF) and Cybersecurity requirements.

5.6.3.3 The Contractor shall support the PLM System cybersecurity requirements identified in the authority to operate (ATO) from the (NAO) Naval Authority Official.

# GOVERNMENT FURNISHED PROPERTY

The Government will provide access to office space and equipment at the Government facility to the on-site contractor personnel for use in support of this task order.

## Government Furnished Information/Property/Equipment (GFI/P/E)

### Government Furnished Information:

The Government will furnish technical information the contractor requires to perform tasking. This may include any existing documents, drawings or databases required to perform tasks under this SOW. Updates to GFI may be proposed by the contractor at any time and will be coordinated with the COR.

### Government Furnished Property/Equipment:

GFP/GFE required by the contractor will be identified within 30 days of the start of tasking under this contract. Updates to GFP/GFE may be proposed by the contractor at any time and will be coordinated with the COR.

# CONTRACTOR ACQUIRED MATERIAL

## Contractor Material List:

7.1.1 The Contractor shall identify any materials and associated equipment required to execute the tasking of this SOW.

Material may include hardware, software, supplies, and services/equipment required for maintenance.

7.1.2 Material purchase requirements will be developed upon approval from the COR or Contracting Officer; the Contractor shall procure approved materials required to execute this SOW.

## IT Procurement:

7.2.1 The Contractor shall not purchase any IT on behalf of NAVAIR in support of this Contract, without a written authorization from the COR.

## Repair Items:

7.3.1 The purchase of equipment and materials for repairs shall be limited to routine, low cost items (i.e. cables, keyboards, rack components, power cords, connectors, pins, etc.), which have unit prices less than $2500, and are within the scope of the contract, may be purchased without Government approval.

7.3.2 However, the information required by paragraph (a) shall be attached to each invoice submittal.

## Material Purchase Approvals:

The purchase of equipment and materials, with an individual unit price in excess of $2500 but less than $20,000, and that are within the scope of the contract, will be referred to the Contracting Officer, via the COR. These items may be purchased by the contractor only after written approval by the Contracting Officer is provided to the Contractor.

# TRAVEL

8.1 The Contractor shall deploy personnel to various Continental United States (CONUS) locations.

8.2 The COR shall ensure that all Travel has been approved at the appropriate level within the PMA-268 Program Office.

8.3 The Contractor shall ensure that this approval has been obtained prior to any travel occurring.

8.4 The Contractor shall travel by the most economical means available and that is allowable and allocable by the Joint Travel Regulations (JTR).

The Government will not reimburse any travel expenses that are not within the rates of the Joint Travel Regulations (JTR) without COR approval.

# Inspection/Acceptance Plan

9.1 Inspection and acceptance shall be at NAS Patuxent River, MD.

9.2 The acceptance shall be in accordance with the Integrated Data Environment (IDE) Plan, PMA-268 Configuration Management Plan, PMA-268 PLM System & Software Requirements Documents, NAVAIR Cybersecurity Plan, provided by the government.

9.3 All acceptances shall be witnessed by Government personnel who, upon satisfactory completion of the acceptance, will sign and date a DD 1149’s depicting those items that were accepted.

# OTHER Considerations/Requirements

Normal Work: Under this order will be done during normal working hours Eastern Standard Time (EST) when practical. However, due to operational requirements, schedules, and the availability of required resources and/or downtime of those resources, extended hours including weekend work may be required. Approval from the Contracting Officer’s Representative (COR) and Program Manager is required prior to any extended work week performance.

Location.: The work will be performed at but not limited to the following locations: TX, KS, MD, NC, FL, and MI Additional locations may be identified by the contractor and may be approved subject to compliance with all terms of the SOW. Access to other Government locations as required for meetings will be provided.

# Deliverables

The following Table is the Contract Data Requirements List.

|  |  |  |  |
| --- | --- | --- | --- |
| **CDRL #** | **Description** | **DID** | **SOW Ref** |
| A001 | Contractors Progress, Status and Management Report | DI-MGMT-80227 | SOW 4.4.1 |
| A002 | System/Software Integration Plan | DI-SESS-82044 | SOW 4.1.1.2 |
| A003 | Integrated Program Management Report (IPMR) / IMS | DI-MGMT-81861A | SOW 4.1.1.3, 5.6.5 |
| A004 | Digital System Model (DSM) | MIL-M-29532(EC) | SOW 2.1.1, 5.6.2 |
| A005 | Operational Security (OPSEC) Plan | DI-MGMT-8099343C | SOW 5.6.9 |
| A006 | Training Conduct Support Document / Master Training Deliverable | DI-PSSS-81523C | SOW 2.1.1, 5.6.1, 5.6.2, 5.6.4, 5.6.6 |

## Appendix A Government Furnished Information

To be provided by the Government within 30 days of contract award or as developed.

## Delivery Tasking

This Tasking will focus on delivering all the final standards, architectures, schemas, business rules, lessons learned, training curriculum and an outside V&V of the system to ensure that the Digital Thread is achieved.

11.2.1 The Contractor shall deliver all completed capabilities for the PMA-268 Product Lifecycle Management (PLM) System in accordance with the Product Lifecycle Management (PLM) Plan for PMA-268 Unmanned Carrier Aviation (UCA) program office.

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11.2.2 The Contractor shall ensure that all business, engineering and logistical processes required to manage the MQ-25 Program are in place and functional within the completed capabilities of the PMA-268 PLM System.

1. Government Furnished information

To be provided be provided by the Government within 30 days of contract award or as developed.