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NASA Procedural Requirements

COMPLIANCE IS MANDATORY**NPR 7120.9**Effective Date: March 11,
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Request Notification of Change (NASA Only)

Subject: NASA Product Data and Life-Cycle Management (PDLM) for Flight Programs and Projects

Responsible Office: Office of the Chief Engineer[| TOC](#) | [Preface](#) | [Chapter1](#) | [Chapter2](#) | [Chapter3](#) | [AppendixA](#) | [AppendixB](#) | [AppendixC](#) | [AppendixD](#) | [ALL](#) |

Appendix A. Definitions

A.1 Authoritative Data. Data that has been designated as valid for specific official programs/projects. The designated data is controlled by processes. (Source: NPD 7120.4, NASA Engineering and Program/Project Management Policy)

A.2 Authoritative Source. An application or repository identified as the official source for specific authoritative data. (Source: Adapted from NPD 7120.4, NASA Engineering and Program/Project Management Policy definition of Authoritative Data)

A.3 Bill of Material (BOM). A listing for a semi-finished or finished product (e.g., end item) containing component parts and materials making up a single instance of a product with a name, reference, or part number, quantity, and unit of measure for each component. A BOM is a representation of product information for a particular purpose such as engineering, manufacturing, procurement, or sustainment. An indentured, hierarchical BOM is a form of product breakdown structure because it captures product component relationships as well as identity and quantity. (Adapted from Department of Defense and industry sources)

A.4 Computer-Aided Design (CAD). Process of creating engineering designs defined by electronically produced multi-dimensional geometry using special software systems, the tools used by engineers to create geometric-based design definitions represented in a variety of formats, including two-dimensional drawings, three-dimensional solid models, envelopes, wireframes, and kinematics and time-based models.

A.5 Configuration Management. A management discipline applied over the product's life cycle to provide visibility into and to control changes to performance, function, and physical characteristics. (Source: NPR 7120.5, NASA Space Flight Program and Project Management Requirements) Also, a process that establishes and maintains consistency of a product's attributes with the requirements and product configuration information throughout the product's life cycle. (Source: NASA-STD-0005, NASA Configuration Management (CM) Standard)

A.6 Data. A representation of facts, concepts, or instructions in a manner suitable for communication, interpretation, or processing by humans or by automatic means. (Source: ISO/IEC 24765:2009, Systems and software engineering vocabulary)

A.7 Data Architecture. Provides an understanding of what information is needed to effectively execute the Enterprise's business processes and provides a framework for effectively managing the Enterprise's information environment. Data Architecture links information behavior (i.e., accessing, using, and sharing data), information management processes, and information support staff to other aspects of the Enterprise. (Source: NPR 2830.1, NASA Enterprise Architecture Procedures)

A.8 Data Life Cycle. The series of states that a data object can take from its creation to its retirement or destruction; generally, these states represent maturity levels or indicate suitability for, or restrictions on, use.

A.9 Data Management. The disciplined processes and systems that plan for, acquire, and provide stewardship for

product and product-related data, throughout the product and data life cycles. (Source: NPR 7123.1, NASA Systems Engineering Processes and Requirements)

A.10 Data Model. Identifies the data, their attributes, and relationships or associations with other data. (Source: Department of Defense Directive 8320.03, Unique Identification (UID) Standards for a Net-Centric Department of Defense, March 2007)

A.11 Delivery. Applies to the hand-off, which may be physical or virtual in the case of data, at initial delivery of an item during development, for collaboration, in support of reviews, at the time of acceptance, and for subsequent modifications, maintenance, refurbishment, or any other activity that produces new data.

A.12 End Item. A product to be delivered under contract as an intact unit or to be assembled, completed, and made ready for use as a unit.

A.13 Engineering Release. An action whereby engineering documentation or an item is officially made available for the intended use. (Source: Modified from NASA-STD-0005, NASA Configuration Management (CM) Standard)

A.14 Governance Framework (Model). The framework--principles and structures--through which the Agency manages the mission, roles, and responsibilities. (Source: NPD 1000.0, NASA Governance and Strategic Management Handbook)

A.15 Metadata. Data about data, including information describing aspects of actual data items, such as name, type, format, content, and other descriptive information.

A.16 Product. A part of a system consisting of end products that perform operational functions and enabling products that perform life-cycle services related to the end product or a result of the technical efforts in the form of a work product (e.g., plan, baseline, or test result). (Source: NPR 7123.1, NASA Systems Engineering Processes and Requirements) Products include, but are not limited to, spacecraft, launch vehicles, instruments, payloads, software, launch platforms, and other elements that are necessary components to deliver a completed vehicle.

A.17 Product Breakdown Structure. A hierarchical view of the relationship of products and component products. (Source: NPR 7120.4, NASA Engineering and Program/Project Management Policy)

A.18 Product Data Management (PDM). The framework that enables organizations to manage and control engineering and technical information, specifically data surrounding the product's design, definition, and related engineering, manufacturing, and logistics processes and is a key element of PLM. From the product perspective, PDM organizes data required for design evolution, tracks versions and configurations of evolving design concepts, and manages archived data and other product-specific information. PDM tools provide access to product structures and other engineering data such as requirements, as-built, and safety and mission assurance data. From the process perspective, PDM systems offer the capability to orchestrate controlled procedural events such as design reviews, approvals, product releases, and configuration audits. (Source: NPD 7120.4, NASA Engineering and Program/Project Management Policy)

A.19 Product Definition Data (PDD). The data objects and associated elements required to completely define a product. In normal usage, PDD refers to the authoritative design engineering design definition, but it can include data associated with production, operations, maintenance, and disposal. (Source: Adapted from ISO 16792, Technical product documentation -- Digital product definition data practices)

A.20 Product Life Cycle. A series of states that generally defines the maturity level of a product and correlate with specific uses or users. Commonly, each state is represented by an agreed-to collection of information that identifies and establishes the attributes of a product at a point in time and that serves as the basis for defining change. A product's life cycle begins with a concept and ends with disposal.

A.21 Product Life-cycle Management (PLM). A strategic business approach that applies a consistent set of business solutions in support of the collaborative creation, management, dissemination, and use of product definition data/information across the extended enterprise from concept to end of life. PLM integrates people/organizations, processes, and information. In product-dominated endeavors, PLM serves as the information backbone that extends outside the enterprise. PLM implementations may be composed of multiple elements, including foundation technologies and standards (e.g., Extensible Markup Language, visualization, collaboration, and enterprise application integration), information authoring tools (e.g., mechanical computer-aided design, electrical computer-aided design, and technical publishing), core functions (e.g., data vaults, document and content management, work flow and program management), functional applications (e.g., configuration management), and business solutions built on the other elements. (Source: NPD 7120.4, NASA Engineering and Program/Project Management Policy)

A.22 Product Data and Life-cycle Management (PDLM) System. A combination of the information technology applications, users, and processes that implement the management of product data across the product life cycle.

A.23 Program. A strategic investment by a Mission Directorate or Mission Support Office that has a defined architecture and/or technical approach, requirements, funding level, and a management structure that initiates and

directs one or more projects. A program defines a strategic direction that the Agency has identified as critical. (Source: NPR 7120.5, NASA Space Flight Program and Project Management Requirements)

A.24 Project. A specific investment having defined goals, objectives, requirements, life-cycle cost, a beginning, and an end. A project yields new or revised products or services that directly address NASA's strategic needs. They may be performed wholly in-house; by Government, industry, academia partnerships; or through contracts with private industry. (Source: NPD 7120.4, NASA Engineering and Program/Project Management Policy)

A.25 Software. Computer programs, procedures, rules, and associated documentation and data pertaining to the development and operation of a computer system. Software also includes but is not limited to commercial off-the-shelf (COTS) software, Government off-the-shelf (GOTS) software, modified off-the-shelf (MOTS) software, embedded software, reuse, heritage, legacy, auto-generated code, firmware, and open source software components. (Source: NPD 7120.4, NASA Engineering and Program/Project Management Policy)

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