

National Aeronautics and Space Administration
Headquarters
Washington, DC 20546-0001



NRW 7120-32

November 4, 2010

Reply to Attn of: Office of the Chief Engineer

TO: Associate Administrator, Internal Controls and Management Systems

FROM: Chief Engineer

SUBJECT: Request for Requirement Waiver for NPR 7120 Draft 6, NASA Product Data and Life-Cycle Management (PDLM) for Flight Programs and Projects

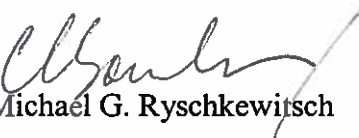
In accordance with section 3.8.2 of the OICMS Directives Manager Desk Guide, the Office of the Chief Engineer (OCE) requests an additional 30 days of official review for NPR 7120 Draft 6, NASA Product Data and Life-Cycle Management (PDLM) for Flight Programs and Projects.

Our office requests this waiver to continue resolution of nonconcurrency from the Goddard Space Flight Center (GSFC) flight project management. OCE is communicating with GSFC to help them understand the Agency problem being addressed with PDLM and the benefits to be gained. Two nonconcurrences were resolved during the last 30 days.

The OICMS Directives Manager Desk Guide, section 3.2.1 states that *"the review period for NPDs is 20 calendar days and the review period for NPRs is 30 calendar days. NPDs must be coordinated in 60 calendar days from start to finish, and NPRs must be coordinated in 90 calendar days from start to finish."*

This directive has exceeded this requirement. Currently, the directive has been in official review and disposition for 98 days, which includes a previously granted 30-day extension.

I appreciate the cooperation extended by your office during this process. Ms. Maureen Moore is the Directives Manager for the OCE and can be reached at 358-1822.


Michael G. Ryschkewitsch

Enclosure

Approval: 

Louis Becker
Associate Administrator for Internal
Controls and Management Systems

**Product Data & Lifecycle Management (PDLM) NPR
Preparation Chronology Through November 3, 2010**

Engineering Management Board PDLM Briefing –January 15, 2008

The Office of the Chief Engineer (OCE) and Office of the Chief Information Officer (OCIO) were requested to prepare a NPR identifying PDLM requirements for Flight Projects. OCIO and OCE jointly briefed the Engineering Management Board (EMB) on PDLM requirements at a meeting at Stennis Space Flight Center. All Centers were represented and the consensus was that documenting product data management requirements would be beneficial.

Engineering Management Board PDLM Status Update –December 2 & 3, 2008

OCE and OCIO, provided a status update on the preparation of the NPR to EMB members with all Centers represented. Two requirements development workshops had been held and a third was planned in February 2009 to finalize the PDLM NPR. In addition, the OCE Technical Standards program had initiated the development of a Computer Aided Design (CAD) Interoperability Standard for the Agency. A separate briefing by JSC, Technical Standards Lead, was made to EMB members. This effort was also endorsed by the EMB members and engineering division chiefs from across the agency.

First NODIS Review-- September 2009

- Received 340 comments
- MSFC, GSFC Non-concurred
- OCIO, and SMD No response
- Review Period closed October 30, 2009
- 30 Day Extension approved on November 5, 2009
- Unable to resolve non-concurrences by deadline—pulled NPR from NODIS

Chronology of actions taken to resolve GSFC Non-Concurrence (First NODIS Review)

- December 1, 2009 – Meeting occurred between GSFC Engineering Director and engineering staff, and OCE regarding GSFC non-concurrence to the PDM/PLM NPR. GSFC felt that the applicability of the NPR to GSFC programs and projects would add cost with no incremental value. Goddard was particularly concerned about potential for supplier cost impact. GSFC reaffirmed their position on the NPR as non-concur.

**Product Data & Lifecycle Management (PDLM) NPR
Preparation Chronology Through November 3, 2010**

- January 28, 2010 – Meeting occurred between GSFC Engineering Director and engineering staff and OCE. Agreement was reached to exempt GSFC from writing a PDLM plan for loosely and uncoupled Programs.
- March 16, 2010, Additional comments received from GSFC to address Modeling and Simulation per NASA -STD-7009 in the NPR.
- April 23, 2010 – Informal comments received from GSFC Flight Directorate, Comments were dispositioned, and document was updated accordingly.
- April 29, 2010 – Meeting occurred between GSFC Engineering Director and OCE to discuss disposition of all comments received. Agreement was once again reached to proceed, and GSFC agreed to concur with the document.

Engineering Management Board PDLM Status Update –March 3, 2010

OCE provided a status update on the PDLM NPR identifying the changes made as the result of comments to the unsuccessful attempt to process the PDLM NPR through NODIS. All Centers were represented. The need for the NPR was reaffirmed by the EMB members. In addition, the EMB members agreed to support and staff with senior management representatives from their respective organizations a PLDM Steering Committee.

PDLM Steering Committee organization meeting –June 28, 2010

The PDLM Steering Committee holds first meeting, elects chairman and start process of drafting a charter.

OCE provides FY 11 funding for the Steering Committee – July 27, 2010

Chief Engineer approves overguide request funding PDLM Pilot and ongoing Interoperability process development.

Second NODIS Review- July 27th, 2010

- Updated NPR per first NODIS review comments March-April 2010
- Informally socialized NPR May 2010; received informal concurrences from all Centers
- Second NODIS Review began July 27, 2010
- Waiver requested & approved on October 7, 2010; Original Deadline: October 9, 2010; New Deadline: November 8, 2010 for the Purple package
- Received 156 comments
- Initially, OCIO, GSFC, and SMD non-concurred; MSFC Decision “Pending” based on disposition of Comments

**Product Data & Lifecycle Management (PDLM) NPR
Preparation Chronology Through November 3, 2010**

- OCIO Concurred (9/22/2010)
- MSFC Concurred w/ Comments (10/1/2010)
- SMD Concurred w/ Comments (10/7/2010)
- GSFC resolution Pending

Chronology of actions taken to resolve GSFC Non-Concurrence (Second NODIS Review)

- August 26, 2010 – Received Non-Concurrence from GSFC.
- September 17, 2010 - Informal comments received from GSFC Program and Project Management.
- September 28, 2010 – OCE submitted informal disposition to GSFC comments to GSFC.
- October 12, 2010 – Meeting Occurred between GSFC Flight Projects, GSFC Engineering directorate and OCE– Resulted in action to OCE to prepare a Problem Statement/Mission anomaly Scenario along with latest version of the NPR, Resolution Matrix.
- October 12, 2010 –OCE had telecom with GSFC, in attempt to resolve GSFC concerns with the PDLM NPR. As part of this discussion GSFC requested (and OCE provided) a copy of the problem statement, and resolution matrix.
- October 27, 2010 a meeting organized by Deputy AA SMD, at which issues resulting in GSFC nonconcurrence with the PDLM NPR were discussed. Participants were SMD, OCE, GSFC Engineering and GSFC program/project management SMD asked the status of the GSFC review of the Product Data and Lifecycle Management NPR. GSFC reported on their review of the document as well as that of several GSFC contractors. The GSFC position from this review was that the subject was generally addressed in NPR 7120.5, Program and Project Management Requirements for Flight Projects and NPR 7123.1, Systems Engineering, and that additions to these documents was preferable to a new requirements document. GSFC requested a copy of the current "redlined" version of the NPR reflecting accepted comments. On 10/27/2010, OCE provided the "redlined" document to GSFC. GSFC agreed to provide comments by close of business Wednesday, November 3, 2010.

**Product Data & Lifecycle Management (PDLM) NPR
Preparation Chronology Through November 3, 2010**

**Attachment 1
Center disposition Summary - 2nd NODIS review**

Stennis Space Center	C
Office of the Chief Technologist	C
Office of the Chief Information Officer	C
Office of the Chief Health & Medical Officer	C
Office of the Chief Financial Officer	C
Office of the Chief Education Officer	C
Office of Small Business Programs	C
Office of Legislative and Intergovernmental Affairs	C
Office of Independent Program and Cost Evaluation	C
Office of Human Capital Management	C
Office of Diversity and Equal Opportunity	C
Mission Support Directorate	C
Johnson Space Center	C
Innovative Partnerships Program Office	C
Glenn Research Center	C
Dryden Flight Research Center	C
Aeronautics Research Mission Directorate	C
Ames Research Center	CwC
Office of the Chief Engineer	CwC
Office of Safety and Mission Assurance	CwC
Langley Research Center	CwC
Kennedy Space Center	CwC
Exploration Systems Mission Directorate	CwC
Science Mission Directorate	CwC
Marshall Space Flight Center	CwC
Goddard Space Flight Center	NC

<p>Legend: C – Concur CwC – Concur with Comments NC – Non-concur Pending – Concur with Disposition of comments</p>
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<p>PDLM NPR Requirements</p> <p>3.1.1 The Agency CIO shall enable the necessary interoperability between existing and future NASA IT systems and approved interfaces to provide a secure, readily accessible environment such that required collaborative PDLM capabilities can be established for authorized personnel.</p>	<p>7120.SD Applicability</p> <p>Interoperability and collaborative not mentioned.</p>	<p>7123.1 Applicability</p> <p>Interoperability briefly mentioned in regards to external systems.</p>
<p>3.1.2 The Agency CIO shall coordinate the delivery of security capabilities with institutional and Mission Directorate PDLM capability providers in a timely manner to support program and project needs while meeting relevant internal and external security standards.</p>	<p>No mention of coordination with PDLM providers.</p>	<p>Does not mention coordination with PDLM providers in requirements.</p>
<p>3.2.1 In establishing the Data Architecture, the Program Manager shall:</p>	<p>No mention of Data Architecture.</p>	<p>No mention of Data Architecture.</p>
<p>3.2.1.1 Ensure that the Data Architecture is designed to facilitate determination of data objects, data users and uses, data flows, interface, interoperability, and integration requirements for planning and implementing the PDLM capabilities.</p>	<p>No mention of data uses, data flows, data objects or data users.</p>	<p>Data flows, human responses, objects and behaviors are related to the WBS model.</p>
<p>3.2.1.2 Ensure that the Data Architecture provides identification, management, interoperability, and integration of information across business or organizational elements needed to support program PDLM goals.</p>	<p>Organizational and business elements not mentioned, instead, business rules are associated with WBS elements.</p>	<p>Elements are not mentioned in the context of business's or organizations.</p>
<p>3.2.1.3 Ensure that the Data Architecture provides data categorization (e.g., quality, context, access, level of data control, ownership, stewardship, and longevity) and metadata creation and management.</p>	<p>No mention of data control, stewardship, longevity or metadata. Ownership is referenced in the context of life cycle cost.</p>	<p>No mention of data ownership, stewardship, longevity or metadata. Data control is mentioned in an appendix.</p>
<p>3.2.1.4 Ensure that the Data Architecture provides for the creation, storage, and exchange of data, especially PDD, models, and simulations, based on use of common, open industry, National, International, or NASA standards to the maximum extent practical.</p>	<p>No mention of data creation, storage or simulations.</p>	<p>Data creation not mentioned. 'Model' refers to either SE process or WBS model throughout.</p>
<p>3.2.1.5 Ensure that PDD and data related to defining and validating the product design and behavior from the engineering design, engineering test, manufacturing, verification, logistics, configuration and data management, and safety and mission assurance disciplines are managed to meet program requirements and relevant internal guidance (e.g., NASA-STD-7009, Standard for Models and Simulations).</p>	<p>No mention of PDD, validating or engineering test. Safety is referenced extensively. The logistics plan is covered.</p>	<p>Design-for-manufacturing is mentioned as part of the Production Readiness Review. Configuration management is covered.</p>

<p>3.2.1.6 Ensure that data needed for program and project milestones, reviews, mission operations, anomalies, or investigations and decisions and outcomes are identified and managed to provide traceability of data used in decision making.</p>	<p>Data that supports traceability is not mentioned.</p>	<p>Work products required to support traceability to logical decomposition models is covered.</p>
<p>3.2.1.7 Ensure that approaches to product identification elsewhere in program activities and practices preserve the integrity of product data and facilitate its use across the full product life cycle.</p>	<p>No processes are identified to ensure the integrity of product data.</p>	<p>Technical data integrity checks throughout the products lifecycle are covered.</p>
<p>3.3.1.1 Document PDLM capabilities and make them available across the Agency, the infrastructure, security services, and architecture that supports them, their integration and interoperability functionalities, and the parties responsible for delivering them.</p>	<p>Providing infrastructure to protect information from threats is covered.</p>	<p>Providing infrastructure to protect information from threats is covered but not in those words.</p>
<p>3.3.1.2 Ensure that PDLM capabilities meet expectations for population of and access to authoritative data (inclusive of ability to identify the purpose for which it was intended and the originator and the data management and configuration management information) from internal and external sources and the continued availability of as-designed, as-built, and as-flown PDD upon project completion and subsequent product retirement (e.g., pursuant to NPR 1441.1).</p>	<p>Expectations in the context of the Agency, stakeholders, documents and products are mentioned but not in the context of PDLM capabilities. The word 'authoritative' is not used. PDLM capability expectations are not mentioned with regard to information, acquisition or supplier sources. Ensuring the continued availability of as-built and as-deployed PDD is not mentioned or implied, only the collection-of such data is enumerated.</p>	<p>Meeting stakeholder expectations with regards to product integration is the responsibility of the Center Director and PDLM is a key enabler of successful product integration. The word 'authoritative' is not used. PDLM capability expectations from internal and external sources is strongly implied as it related to life-cycle support products. Continued availability of as-built documentation is not considered.</p>
<p>3.3.1.3 Ensure that adequate planning of Enterprise Architecture for PDLM capabilities anticipates NASA's extended life cycle including partners and prime contractors.</p>	<p>Enterprise Architecture is not mentioned</p>	<p>Enterprise Architecture is not mentioned</p>
<p>3.3.1.4 Facilitate the provision of comprehensive search and integrated views (including reports) of data with a high degree of usability.</p>	<p>Search and useability are not mentioned.</p>	<p>Under mission concept review a technical search is called for. Useability is not mentioned.</p>
<p>3.3.1.5 Assess the costs and benefits of providing a single point of access, single sign-on, policy-based or role-based security, support for portable devices, and other access enablers, particularly considering programs with extensive distributed work, challenging environments, or considerable external data exchange.</p>	<p>References the 1600.1 Security Plan which does not address this requirement.</p>	<p>Cost/benefit tradeoffs are to be considered with regards to risk and security. Specifics are not called out.</p>
<p>3.4.1 In establishing the Process Architecture, the Program Manager shall:</p>	<p>Process Architecture not mentioned.</p>	<p>Process Architecture not mentioned.</p>

<p>3.4.1.1 Ensure that the business and engineering processes for PDLM are adequate, controlled, integrated, and have defined relationships between their interdependent sub-processes including but not limited to engineering release, change control, configuration management, data management, and product definition (including product breakdown structures, Computer-Aided Design, models, simulations, and parts libraries; other engineering work products; requirements management; and risk management).</p>	<p>References engineering and CM processes in 7123.1. Business processes are called out. No reference to libraries.</p>	<p>Contains broad reference to common technical processes. No reference to libraries.</p>
<p>3.4.1.2 Ensure that processes include management of data related to safety and mission assurance such as deviations, waivers, corrective actions, and problem resolution including detailing the close-out or buy-off of parts.</p>	<p>No mention of parts.</p>	<p>Close-out of technical reviews from phase to phase is covered.</p>
<p>3.4.1.3 Define mechanisms to ensure adequate process monitoring (e.g., volumes, cycle time, defect rate, rework rate), to review process adequacy as the program matures, and to consider life-cycle costs and value-added analysis techniques in process design.</p>	<p>No mention of process monitoring metrics.</p>	<p>No mention of process monitoring metrics.</p>
<p>3.4.1.4 For tightly coupled programs, define a Process Architecture that supports program-wide integration and interoperability needs and identifies which processes are to be adopted across all projects in the program.</p>	<p>The review plan requires center to center comparison of best practices for tightly-coupled programs. No mention of adopting processes or best practices.</p>	<p>No mention of tightly coupled programs or adoption of processes.</p>
<p>3.4.1.5 For uncoupled and loosely coupled programs, identify which processes, if any, are needed to be interoperable or common across projects to support program-wide needs.</p>	<p>Contains only a vague reference to identifying external dependencies for uncoupled and loosely coupled programs.</p>	<p>No mention of uncoupled and loosely coupled programs.</p>
<p>3.5 PDLM Plan</p> <p>3.5.1 The Program Manager shall produce and maintain a PDLM Plan as follows:</p>		
<p>3.5.1.1 For single-project and tightly coupled programs (as defined in NPR 7120.5), prepare a single PDLM Plan in accordance with the requirements herein and the template in Appendix D unless otherwise directed by the Mission Directorate; such a plan is presumed to reflect concurrence by member project managers.</p>	<p>Nothing is explicitly presumed or assumed herein.</p>	<p>Nothing is explicitly presumed or assumed herein.</p>
<p>3.5.1.2 For programs and projects initiated after the effective date of this NPR, prepare a preliminary, initial plan no later than completion of the System Definition Review.</p>	<p>No mention of this task.</p>	<p>No mention of this task.</p>
<p>3.5.1.3 For programs and projects underway, complete their initial plan in accordance with the applicability statements in section P.2b.</p>		

3.5.2 Because technology changes are independent of program and project phases, the Program Manager shall ensure that the PDLM Plan is assessed at least annually in coordination with capability suppliers; during conceptual, design, development, test, and evaluation phases or, in preparation for program or project phase-out, at reviews associated with or preceding major KDPs as defined in NPR 7120.5; and, during the operational phase, at flight readiness KDPs and at least annually thereafter. Annual PDLM reviews not mentioned. Annual PDLM reviews not mentioned.

3.5.3 The Program Manager shall ensure that contracts associated with their program and its projects acquire data that can be fully and effectively utilized by obtaining sufficient rights to use the data to support all program phases; include language reflecting PDLM interoperability requirements such as NASA-STD-0007, NASA Computer-Aided Design Interoperability, or other documents that facilitate efficient and effective data exchange with minimal rework and maximum data integrity. The SCIENCE DATA MANAGEMENT PLAN calls for data rights and services and access covered. Establishing the rights to technical data is covered. to samples