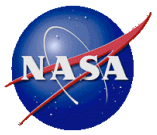


PDS MC Requirements Process

March 29, 2007 (v2)

Definition of Requirements Levels*

- Level 1 Customer Requirements are NASA Headquarters or program derived and allocated requirements on the PDS.

- Level 2 Project Requirements are the derived PDS functionality and the allocated functions to each system.

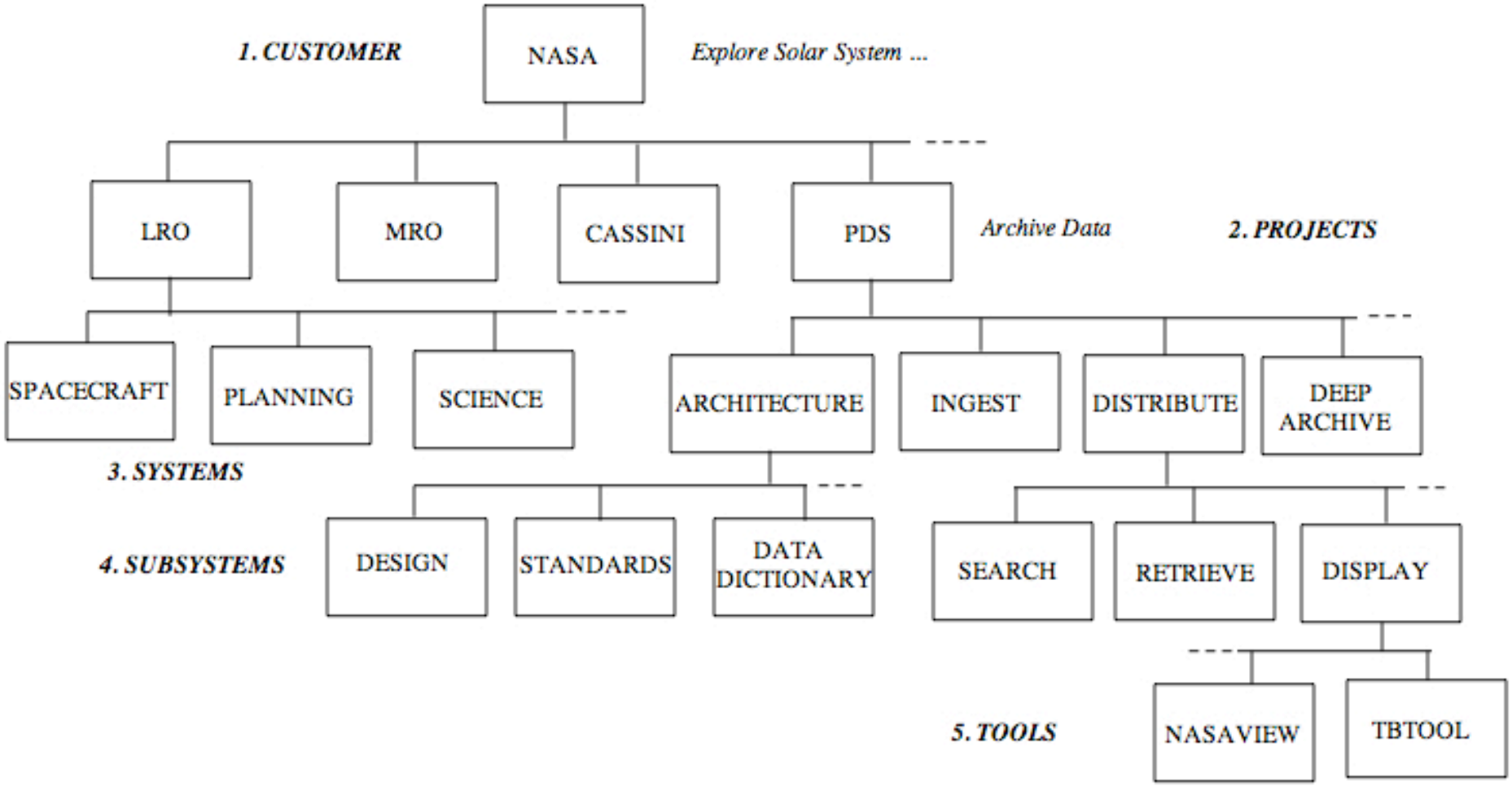
- Level 3 System Requirements are the derived PDS system functionality and the allocated functions to each subsystem.

- Level 4 Subsystem Requirements are the derived PDS subsystem functionality and the allocated functions within elements of that subsystem.

- Level 5 Tool and Component Requirements are the derived functions for the tools and components within each sub-element.

* JPL Flight Project Practices(derived from NASA Systems Engineering Handbook - SP-6105)

PDS Requirements Model*



* Adapted from Dick Simpson (2007-03-28)

PDS Definition of Requirements Levels*

- Level 1 **Customer Requirements** are the NASA Headquarters or program derived and allocated requirements on the PDS.

- Level 2 **Project Requirements** are the derived PDS functionality and the allocated functions to each system.

- Level 3 **System Requirements** are the derived system functionality and the allocated functions to each subsystem.

- Level 4 **Subsystem Requirements** are the derived subsystem functionality and the allocated functions within elements of that subsystem.

- Level 5+ **Tool/Component Requirements** are defined similarly as derived sub-elements and allocated functions for the components within each sub-element including tools of the subsystem.

* Adopted from JPL's Flight Project Practices

NOTE: PDS Management Council approves and manages levels 1-4.

Supporting Definitions (from NASA SE Handbook SP-6105 (1995/2003)

- System - “a set of interrelated components which interact with one another in an organized fashion toward a common purpose. The components of a system may be quite diverse, consisting of persons, organizations, procedures, software, equipment, and/or facilities.”

- Subsystem - “Most NASA systems are sufficiently complex that their components are subsystems, which must function in a coordinated way for the system to accomplish its goals.”

- The following are identified as the “hierarchical system terminology”:

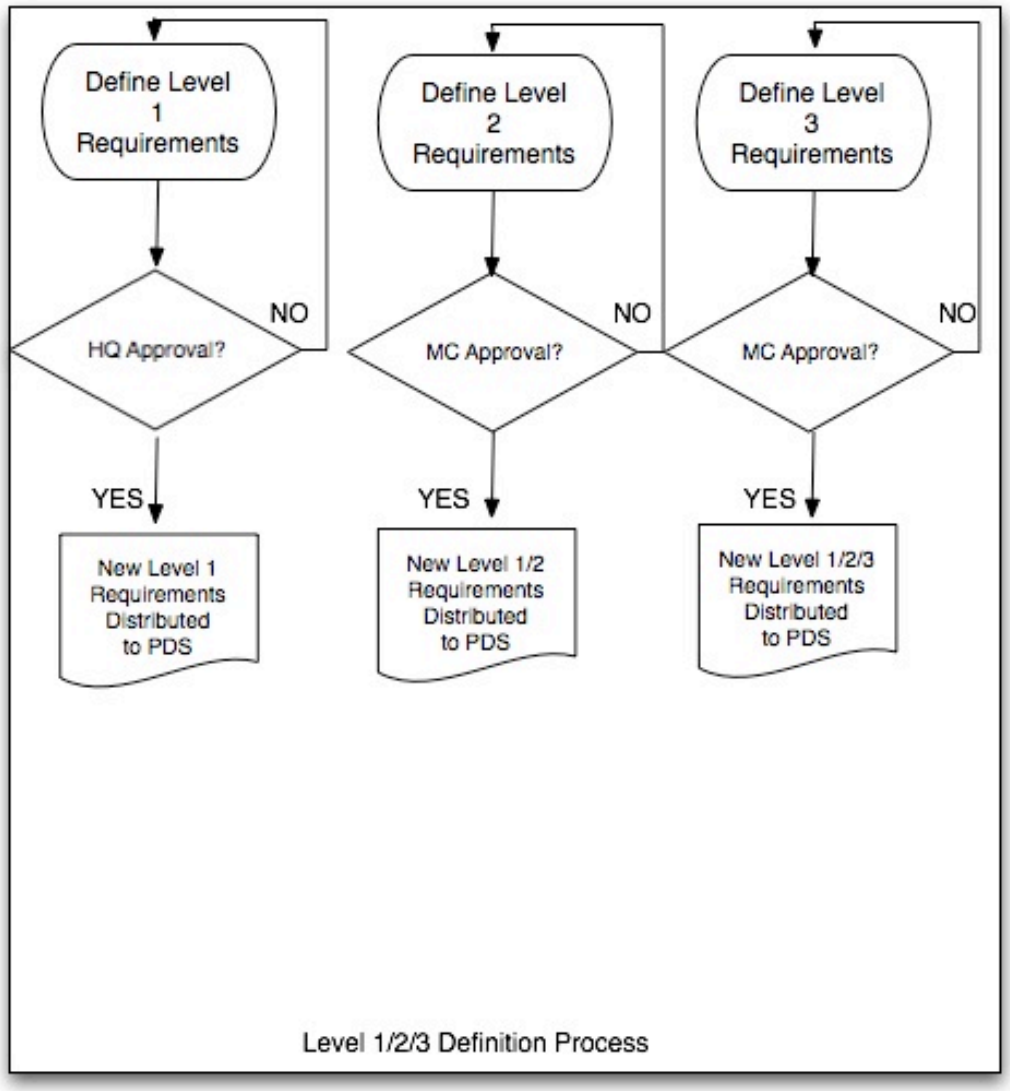
  SYSTEM
  SEGMENT
  ELEMENT
  SUBSYSTEM
  ASSEMBLY
  SUBASSEMBLY
  PART

- NOTE: “Particular projects may need a different sequence of layers - an instrument may not need as many layers. […] Projects should establish their own terminology.”

- Configuration Management - “is the discipline of identifying and formalizing the functional and physical characteristics of a configuration item at discrete points in the product evolution for the purpose of maintaining the integrity of a baseline.”

Managing Level 1-3 Requirements

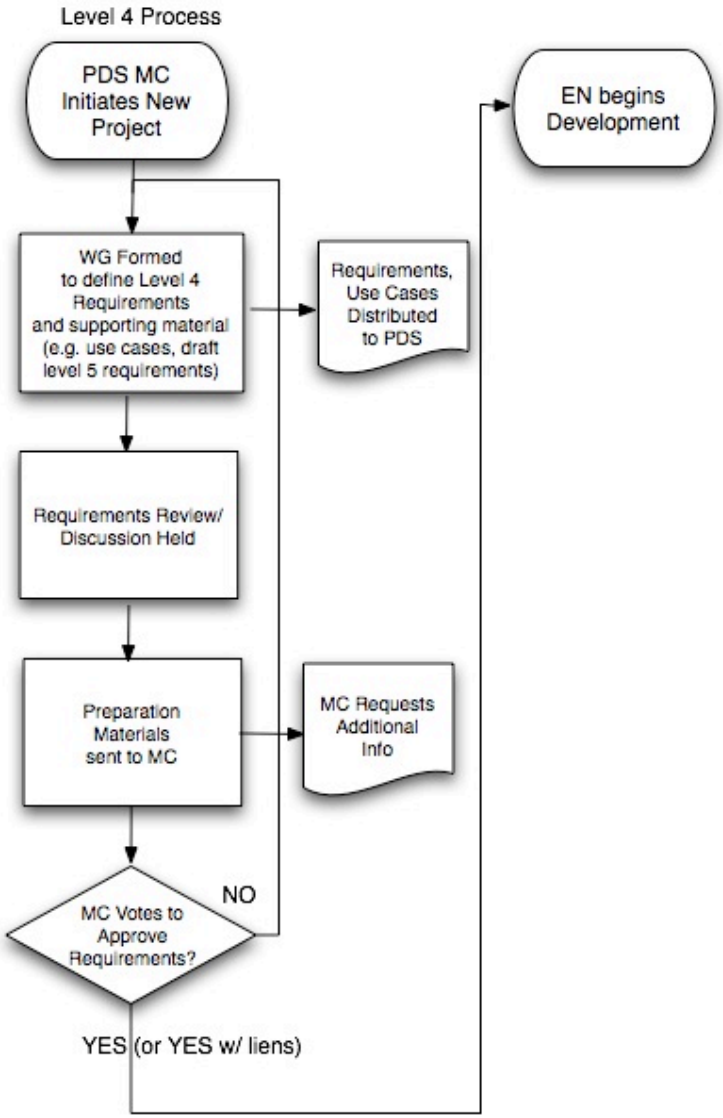
- Level 1 - NASA HQs requirements for PDS (Sponsor Level)
- Level 2 - MC derived requirements on PDS from the sponsor (MC Level)
- Level 3 - PDS System Level requirements (top-level)
- Minor editorial and maintenance changes approved by PDS Program Manager and Program Scientist. Additional requirements at levels 1/2/3 approved by MC with Level 1 concurrence at HQ.



Level 1/2/3 Definition Process

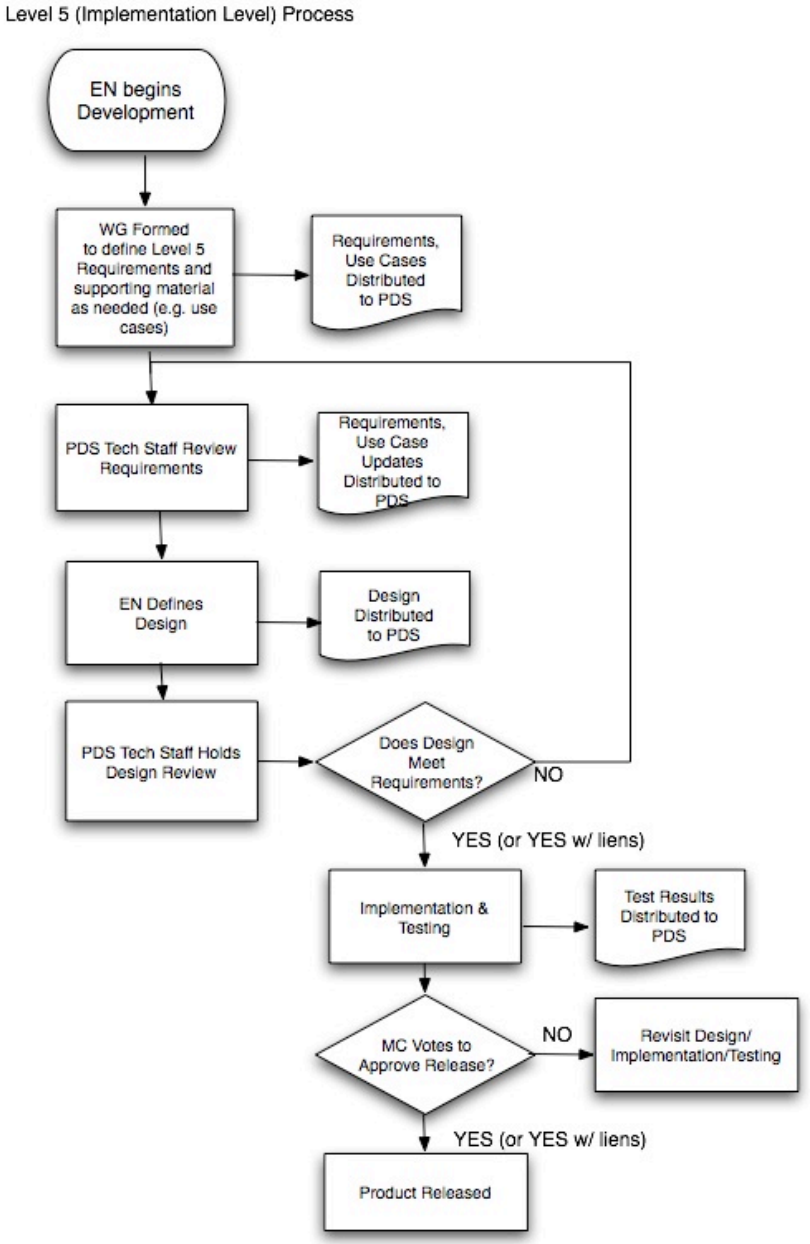
Managing Level 4 Requirements

- Provide a top level definition for the project (tool, component, etc)
- Level 4 requirements definition is a collaboration between EN and the nodes
  - Assume Level 3s are sufficient
- Level 4 requirements may be implemented in multiple phases
- **MC Approves Level 4 before development begins**
- Minor editorial and maintenance changes approved by PDS Program Manager and Program Scientist. Additional requirements approved by MC



Managing the Implementation Level (Level 5+)

- Detailed level 5 requirements (and below) are defined, *as needed,* to ensure the functionality is adequately defined to support the design steps
- All PDS Nodes are kept "in-the-loop" through out the process
  - Open discussions to review requirements, design and testing results will be scheduled
  - Documents are distributed to PDS as they are developed and placed on appropriate websites for access
  - Lead PDS Technical personnel are asked to be involved and to keep their management informed of progress
- Level 4 requirements may be implemented in multiple phases at level 5
- Design, Implementation and Test may cycle multiple times prior to release
  - Movement from design to implementation/test approved by PDS Program Mgr, PDS Program Scientist and EN Manager



Backup

PDS Requirements Levels

PDS Requirements Levels Definition

- Level 1 - NASA HQs requirements for PDS (Negotiated with NASA HQ). These requirements are reviewed yearly and constitute the agreement between PDS and NASA HQs for implementation and operations of the PDS.

- Level 2 - PDS MC derived requirements on PDS from the Level 1 requirements. These provide further specification for the Level 1 requirements. They are developed and approved by the PDS Management Council. They are placed under Configuration Management by the PDS MC.

- Level 3 - PDS System Level requirements (top-level). These requirements serve as a broad set of requirements governing PDS as a system. The Engineering Node leads development of these requirements with participation from the PDS MC. These requirements are approved by the PDS Management Council and serve as the top-level of requirements for implementation. They are placed under Configuration Management by the PDS MC.

- Level 4 - Subsystem/Component/Tool top-level requirements. These requirements serve as the top level of requirements for any tool, component or subsystem. The Engineering Node leads development of the requirements with participation from PDS nodes. They are approved by the Management Council and must be placed under Configuration Management by the PDS MC before development begins.

- Level 5+ - Subsystem/Component/Tool Detailed Requirements. These requirements serve as implementation-level requirements for a tool, component or subsystem. They are used to further specify the functional capabilities of a new tool, component or subsystem in order to complement the development effort. The requirements are negotiated with and distributed to PDS. They are placed under Configuration Management by the Engineering Node.