



National Aeronautics and Space Administration

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

JPL KM Process

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Agenda



- **JPL Guiding Principles**
- **JPL Rules!**
- **JPL Lessons Learned Process**
- **JPL Project Support**
- **JPL Product Data Management System**
- **JPL Electronic Library Service**
- **JPLSpace**
- **JPL Beacon, Technical Reports Server, Unlimited Release System**
- **JPL Wired**
- **JPL Gateway**
- **Others**



JPL Guiding Principles



JPL Rules! DocID 58032, Rev. 8

- Flight Project Practices, Rev. 8
- Design, Verification/Validation & Ops Principles for Flight Systems (Design Principles), Rev. 4
- Available on JPL Rules! System (for JPL internal only) and on NASA Engineering Network (for NASA employees)
- Training for all JPL engineering staff

Requirement: Flight Project Practices, Rev. 8

Process: [Develop New Products](#)

Document Owner: [Chris Jones](#)

Release Date: October 6, 2010

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JPL Rules! DocID 43913, Rev. 4



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Requirement: Design, Verification/Validation & Ops Principles for Flight Systems (Design Principles), Rev. 4

Process: [Develop New Products](#)

Document Owner: Neil Yarnell

Effective Date: September 20, 2010

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JPL Rules!



- All official JPL Rules are centrally managed on JPL Rules!
- Includes FPP and Design Principles
- Rules! embed our most important knowledge and how-to's
- Workflow driven
- Process/Document owner empowered
- Includes waiver system



JPL Lessons Learned Process



- **NPR 7120.6, *The NASA Lessons Learned Process*, was largely modeled on the process implemented by JPL for the past 25 years**
- **Principal features of the JPL lessons learned process:**
 - 1. Lessons Learned Committee (IAW NPR 7120.6, Para 1.4.4)**
 - LLC has met weekly since 1984. Chaired by the JPL OCE, with representatives from SMA and each of the major technical divisions. Functions are to (1) identify, validate, and prioritize lesson learned candidates, (2) prepare and approve lessons learned, and (3) serve as a *de facto* JPL Corrective Action Board
 - 2. Lessons Learned Infusion (IAW NPR 7120.6, Paragraph A.1.2): a four-pronged approach to assure that lessons learned get used by projects**
 - **(1) Targeted Distribution.** JPL CDM reviews newly published LLIS entries and forwards them to appropriate JPL subject matter experts
 - **(2) Project Self-Assessment.** At major project milestones, projects perform detailed reviews of their compliance with NASA lesson learned recommendations



Lessons Learned Process (Continued)



- **(3) Center-Wide Infusion.** LL recommendations are cross-referenced to specific paragraphs in the primary JPL engineering standards-- the *Design Principles* and the *Flight Project Practices*. (With this closed-loop infusion, the institution need not wholly rely on the appropriate person applying a lesson at the proper point in the project lifecycle.)
- **(4) Corrective Action Board.** Project incidents with institutional impacts are reviewed by the LLC which, where warranted, engages the closed-loop JPL Corrective Action Notice (CAN) system to obtain JPL-wide resolution
- **Other features of the JPL lessons learned process include:**
 - 3. Documented Lessons Learned Process** (IAW NPR 7120.6, App A)
 - The JPL lessons learned procedures and process flowchart (Slide #4) are documented in the JPL Lessons Learned Guideline (JPL DocID 72252)
 - 4. Publication in the LLIS** (IAW NPR 7120.6, Para 1.4.4 (b))
 - JPL maintains no lessons learned repository. The LLC submits all lessons learned to the NASA LLIS for NASA-wide and public access



Lessons Learned Process (Continued)



5. **JPL Projects are Required to Submit and Use Lessons Learned** (IAW NPR 7120.5D, Para 3.13)
 - The JPL *Flight Project Practices* (JPL DocID 58032), Para 5.22, requires JPL projects to (1) submit lessons learned to the JPL OCE and (2) review existing lessons learned and take appropriate action
6. **Lessons Learned Dissemination** (IAW NPR 7120.6, Para 1.4.4 (d))
 - The LLC Chair (CDM) periodically e-mails a summary of recently published lessons learned to the JPL Mission Assurance Managers and Project System Engineers for further dissemination to their projects
 - JPL Project Managers now formally report lessons learned at major project milestones– SRR, PDR, CDR, PLAR, end of primary mission
7. ***De facto* Corrective Action Board** (IAW NPR 7120.6, Para 1.4.4 (c))
 - A JPL PRACA report (i.e., PFR, ISA) may be designated as a Lesson Learned Candidate. By reviewing these reports for Center-wide impacts, the LLC provides the only functional link between the JPL PRACA system and the JPL Corrective Action Notice (CAN) system. This additional LLC role transcends the lesson learned process by cost effectively identifying Center-wide engineering process deficiencies



JPL Project Support



• Knowledge resource portal for JPL Flight Projects

- Key deliverables, artifacts, guidelines
- Templates and Examples
- All Lab-wide services for projects (launch services, IT services, scheduling, systems engineering, etc.)

The screenshot displays the JPL Project Support website interface. At the top, there is a navigation bar with links for JPL SPACE, JPL RULES, EBIS, JPL PUBLIC HOME, CALTECH, and NASA. The main header features the 'JPL PROJECT SUPPORT' logo and a 'Formulation' banner image. Below the header, a welcome message states: 'WELCOME TO JPL'S PROJECT SUPPORT WEBSITE. The Project Support Website assists project managers and team members by providing convenient access to information and support for projects, with a focus on project planning activities and developing lifecycle gate products. This includes document templates, tools, services and training information. Together with The Frontline Website, which focuses on strategic, conceptual, and early formulation activities, support is provided throughout a project's lifecycle.'

The main content area is organized into four columns:

- PROJECT INFORMATION:** Information, status and calendars for current projects. Includes links for Summary Information, Projects' Key Contacts List, Projects by Phase, Monthly Report, Quarterly Report, and Project Manager's Meeting.
- PROJECT REQUIREMENTS:** Institutional requirements, guidelines, templates and examples. Includes links for JPL Policies, Flight Project Practices, Design Principles, Software Development Requirements, Life Cycle, Reviews, Gate Products, Examples & Templates, and Standard WBS.
- TECH & MGMT SUPPORT:** Information about institutional support available for projects. Includes links for The Frontline, Proposal Development Support, Help for New Projects, Project Management, Project Systems Engineering, Software Engineering, Safety & Mission Assurance, Science & Technology, Spacecraft System, Mission Operations System, Launch System, Ground Data System, Systems Integration & Test, Education & Public Outreach, Mission Design, Training & Education, and Centers & Facilities.
- NASA LINKS:** Links to NASA information resources that are useful to JPL Projects. Includes links for POLARIS, NASA Engineering Network (NEN), NPR 7120.5D (NODIS), NPR 7123.1A (NODIS), NASA Lessons Learned, and NASA Graphics Markings.

On the right side, there is a vertical navigation menu with links for Home, Contacts, Feedback, Admin Login, Project Status, and Summary Login.

At the bottom, there are two sections:

- FREQUENTLY ACCESSED DOCUMENTS:** A list of documents including Flight Project Practices, Design Principles, JPL Gate Products List, Rev 8, Flight Subsystem Hardware Gate Products Listing, Rev 0, JPL Standard WBS, Rev 5, Project Time and Cost per Phase Rules of Thumb, JPL Project Summary Bar Charts, and Project Reference List.
- WHAT'S HOT:** A list of recent updates including Flight Hardware Hierarchy and Nomenclature, Rev. 0 (NEW), NASA Project Management Challenge 2012: Evolve & Excel (NEW), NPR 7120.5 Rev E Roll-Out Briefing at JPL Dec 13, 2011 (NEW), Cost & Schedule Assessment Reporting Dec 13, 2011 (NEW), Reviews & Independent Assessments Dec 13, 2011 (NEW), 7120 Roll-Out Conclusion Dec 13, 2011 (NEW), Implementing Projects in JPL's Matrix Organization, Overview JPL-Certification of NASA Spaceflight Project Managers, and JPL Project Manager Competencies Assessment Tool.



Product Data Management System



PDMS
Product Data Management Systems

Logout

Home Product Data Management Systems

The Product Data Management System (PDMS) is the data management system and suite of tools provided to programs, projects, and tasks to help them manage and control their data and information. PDMS is the official repository and archive for all engineering data and information generated in the course of any JPL engineering activity.

What's New

Critical Notice: Various Bug fixes and Enhancements were rolled out. Go to the Help Document Library > Rollout folder to download and view the fixes and enhancements. Please clear your cache and click Shift Refresh.

- Inbox – Displays tasks that are assigned to you.
- Create – Brings up different creation wizards for record submission.
- Search – Perform Searches of records in the system.
- MCDL & Reports – Master Controlled Drawing/Document Lists & Custom Reports.
- Record Forms – Project forms used for different record types.
- PDMS Help – The PDMS Help Center for access of user guides, video tutorials, self-paced training materials, brochures, installations, and other Help Materials.

Quick Links:

TEAMCENTER community

DSN
Document Index

JPL IT Service Desk
(4-HELP)
(818) 354-4367
http://jpl.it.nasa.gov

- Central information service for flight project designs, drawings, ECR's, CI's, AIDS
- Embeds our FPPs and Design Principles
- Comes with a Configuration Management Engineer



Electronic Library Service



- Central information service for flight project documents, formal, informal, in work
- Embeds our FPPs and Design Principles
- Allows access to knowledge from archived projects
- Comes with an Information Management Engineer

The screenshot displays the JPL Electronic Library Service interface. At the top, there is a navigation bar with links for Home, What's New, Users & Groups, and Help. Below this is a search bar and a 'Go' button. The main content area is titled 'My DocuShare' and shows a 'Personal Collection' section with a message: 'There's currently no content in your personal collection.' Below this is a 'Workspaces' section with a table of workspaces. The table has columns for Type, Title, Owner, Edited, Size, and Actions. The table lists several workspaces, including 'Active Archive', 'AIR'S Project Library (AIRS)', 'Astronomy, Physics, and Space Technology (APST) Directorate', 'Astrophysics & Heliophysics Formulation Office 710', 'ATHLETE Project (All Terrain Hex Legged Extra Terrestrial Explorer)', 'Business Operations Directorate', 'CAE Tools & Processes (CAE)', and 'Center for Space Mission Information & Software Systems (CSMISS)'. The 'Center for Space Mission Information & Software Systems (CSMISS)' entry is marked as 'Archived Library'. On the right side of the interface, there are sections for 'Favorites' and 'My Groups', each with a 'Show: All' dropdown and a 'Go' button. The 'My Groups' section lists various groups such as 'all jpl', 'all us', 'all usjpl', 'ICIS 554 Enterprise Applications', 'ICIS 555 Enterprise Infrastructure', 'ICIS All', 'JPL All_Employees-JPL_AFF', 'JPL All_Employees-JPL_Only', 'JPL_Org_17', 'JPL_Org_17_Personnel_Ext', 'JPL Implementation Team', 'jpls fl ds-wam', 'KM Librarians', 'All Users and Guest', 'All Users Except Guest', and 'All Users Except Read-Only'. At the bottom right, there is a 'Tasks' section with the text 'View your current tasks.'



Computer-Aided Engineering



SERVICES
CAE Home
Getting Started
CAE Help Center
CAE Tool Policies
CAE Related Sites
Blogs
Community
Computers
Downloads
FAQs
Tool List
Tool Rates
Tool Usage
CAE Insider
MATLAB
DOORS

Current CAE News

4-5922 for details.

--- **New AutoDesk Tools** ---

AutoCAD 2012 and 3dx MAX Design 2011 are now available through the [ECAE](#) page. Please call Jim Hu at 4-5922 for details.

--- **ECAE Blog now online** ---

The ECAE Blog is now available. Click [here](#) to access. Use your JPL username and password to login. Contact [Eric Cassell](#) for details.

--- **Yitav ICE 11.1 is now available** ---

Charter

The Institutional Computer Aided Engineering (CAE) Tool Service provides the Laboratory's Engineering Staff & Scientific communities with state-of-the-art CAE Design Automation Tools and processes to support JPL projects (Reference, [JPL Rules](#)).

The Office of the Chief Information Officer (OCIO) supplies support for these tools and processes through the CAE Tool Service. The CAE Tool Service works with the technical divisions to select and provide tools and develop the associated processes.

There are 3 tool services within CAE;

- [ECAE](#) - Electrical and RF&EM tools
- [MCAE](#) - Mechanical tools
- [SS-CAE](#) - System & Software tools

Responsibilities of the service centers;

- [ECAE](#) - Divisions 33, 34, 37 & 38
- [MCAE](#) - Division 35
- [SS-CAE](#) - Division 31

Institutionally Funded Tools

[MATLAB](#), [ArcGIS](#), and [Dynamic Object Oriented Requirements System \(DOORS\)](#) are funded by the institution and are available at no cost.

- Central service for CAE tools (MatLab, NX, CATIA)
- Shared licenses
- Integration with PDMS
- Embeds our FPPs and Design Principles
- Discipline knowledge embedded in templates, models, examples



- JPL Institutional Portal
- Portal to all resources, plus news, announcements, search, quicklinks, JPL 101

The screenshot displays the JPLSpace website interface. At the top, there is a navigation bar with links for JPL RULES, EBIS, JPL PUBLIC HOME, CALTECH, NASA, CONTACT US, HELP, and SIGN IN. Below this is a search bar and a main menu with categories: HOME, EMPLOYEE CENTER, TOOLS & SERVICES, NEWSFEEDS, LINE ORGS, PROJECTS, INTEREST & WORK GROUPS, and BOOKMARKS.

The main content area is divided into several sections:

- TOP STORIES:** Features a large image of NASA Administrator Charles Bolden speaking at a podium. The headline is "NASA rolls out FY13 budget request". Below the image, it states: "NASA Administrator Charles Bolden (above) rolled out the administration's fiscal year 2013 budget request for the agency at a news conference Monday, Feb. 13." There is a "More Top Stories" link below.
- MY INFO:** Includes a "Sign In" prompt to use a profile, a "Bookmarks" section with a "Sign In" prompt to use bookmarks, and a "QUICK LINKS" section with various utility links like "BOSS Business Ops Support", "Cafeteria Menu", "Conference Rooms", etc.
- WEATHER:** Shows the current weather for Pasadena as "Partly Cloudy" with a temperature of 59° F. It also displays humidity (42%) and wind (0mph). There is a "City or Zip" input field and a "10 day forecast" link.
- UPCOMING EVENTS:** Features a "CALENDAR" section with several event listings:
 - "Model-based design, engineering and development analyzed in Tuesday webcast" by Kirstie Belman of the Aerospace Corp.
 - "Antarctica's Lake Vostok is test case for exploring icy Jupiter moon" from Space.com.
 - "Experts react to NASA's 2013 budget request" from Space.com.
 - "NASA funding cuts coming, space exploration to suffer?" from Fox News.
 - "Remembering Explorer 1" from Glendale News-Press.
 - "Ocean current slowdown made Earth spin faster" from New Scientist.
- TRAFFIC:** Shows a map of the Pasadena area with traffic conditions. Major roads like 210, 10, and 110 are visible. A "live traffic" timestamp is provided.
- ANNOUNCEMENTS:** Contains several notices, including a security warning: "[d[Max] Attention: Your identity will expire in 60 days?", and other updates about property processes, procurement, and course offerings.
- STATUS:** A small section at the bottom left showing a "National Terrorism Advisory System" alert.



The screenshot shows the JPL Beacon website interface. At the top, there is a navigation bar with links for 'JPL HOME', 'EARTH', 'SOLAR SYSTEM', 'STARS & GALAXIES', and 'SCIENCE & TECHNOLOGY'. Below this is a search bar and a 'Login with JPL Username' button. The main content area is titled 'BEACON information COMMONS' and includes a 'Historical Photo of the Month' section with a photo of a camera being studied. There are also sections for 'NEWS' and 'EVENTS' with lists of recent items. A sidebar on the left contains a navigation menu with categories like 'HOME', 'Search', 'Services', 'Programs', 'Archives', 'Records & Engineering Document Services (EDS)', 'Marking&Handling', 'JPL Authors', and 'News and Events'. The footer contains search icons and maintenance information.

- Portal to Library services
- Online journals, library books, purchase new books, archive of all JPL scientific papers and reports, engineering documents, photos



- JPL engineering wiki
- Peer contributed knowledge and knowledge that needs a home

Dashboard / JPL Wired / JPL Wired Comprehensive Table of Contents

JPL Wired Comprehensive Table of Contents

Added by [Mark Stobbe](#) last edited by [Mark Stobbe](#) on Sep 23, 2019 [View changes](#)

NOTE
This table of contents is FOR REFERENCE ONLY because there is no perfect way to organize the articles. Like Google, information should primarily be located using the search function

For a list of every JPL Wired article, see [English Articles](#)

Wired comprehensive table of Contents

- Expand all Collapse all Search
- [-] [Overview](#)
 - [-] [Aerospace](#)
 - [-] [Communications, Tracking and Radar](#)
 - [-] [Engineering Systems, Planning in Component Mode Synthesis Modes in AGAMS through Global Optimization](#)
 - [-] [Entry, Descent, and Landing \(EDL\)](#)
 - [-] [Aerodynamic Descent](#)
 - [-] [Ascent](#)
 - [-] [Codes for Standard Mechanical EDL Paths for Proposals](#)
 - [-] [From Lags to APass](#)
 - [-] [History of EDL studies](#)
 - [-] [Landing Bodies, Wing Bodies, and Lifting Entry](#)
 - [-] [Parabolic Entry, Descent, and Landing \(EDL\) Introductory Course](#)
 - [-] [Venus EDL Subcontractors](#)
 - [-] [Wired assisted overviews](#)
 - [-] [Fabrication and Procurement](#)
 - [-] [Automated Qualification Test \(AQT\)](#)
 - [-] [Designing Components for Turnkey Machining](#)
 - [-] [Designing Hardware for Complex Fabrication Costs](#)
 - [-] [Inspection](#)
 - [-] [Manufacturing Engineering \(MFE\)](#)
 - [-] [Rapid Prototyping](#)
 - [-] [Standard Test Specs](#)
 - [-] [Surface Straightness Chart](#)
 - [-] [Flight Dynamics](#)
 - [-] [Orbita, Trajectory and Interact Laboratory \(ORAIL\)](#)
 - [-] [Auto](#)

Dashboard / JPL Wired / Mechanical Systems Engineering (MSE) / Layman's guide

Layman's guide

Added by [Mark Stobbe](#) last edited by [dimitrylayman](#) on Jun 23, 2019 [View changes](#)

Layman's guide (aka "A Useful Guide for Chief (& Other) Mechanical Engineers" - [JPL DocID: 32329](#)) was written by [Bill Layman](#), who has since retired from JPL. While at JPL, from 1961 to 1989 Bill Layman, held responsibilities such as Chief Mechanical Engineer on Voyager, Galileo and Pathfinder. Layman's guide gives guidance on best practices for leading engineering teams, interacting in meetings and quiet hours, and generally engaging the entire project in engineering excellence.

Content

- 1 Bill Layman
 - 1.1 Career snapshot
 - 1.2 Major Awards
- 2 Content overview of Layman's guide
 - 2.1 Volume 1
 - 2.2 Volume 2
- 3 Videos of Bill Layman presenting Layman's guide
 - 3.1 Volume 1 of 3
 - 3.2 Volume 2 of 3
 - 3.3 Volume 3 of 3
 - 3.4 Volume 4 of 3
 - 3.5 Volume 5 of 3
 - 3.6 Volume 6 of 3
 - 3.7 Volume 7 of 3
 - 3.8 Volume 8 of 3
 - 3.9 Volume 9 of 3
- 4 See also
- 5 References
- 6 Useful links
- 7 JPL points of contact



Bill Layman
JPL Career: 1961 - 1989
Major Project Roles: Chief Mechanical Engineer for
• Voyager
• Galileo
• Pathfinder

Bill Layman

Bill Layman became a JPL employee on July 16, 1961 after attending Stanford University from 1956-1961

Career snapshot

- **Mariner program:** Hardware Engineer for missions to Venus in 1962-1967, to Venus / Mercury in 1973 and to Mars in 1964, 1965, 1971
- **Viking:** Mechanical Systems Engineer
- **Voyager:** Chief Mechanical Engineer
- **Galileo:** Chief Mechanical Engineer
- **Shuttle Imaging Radar C:**
- **Rover Design Team:** Team leader



The screenshot shows the 'gateway' social networking site. The top navigation bar includes 'My Site', 'My Workspace', and 'My Profile'. The main content area is titled 'My Newsfeed' and contains several posts:

- Ma, Ricky W (172E) -> IT CTO Team Space:** 1 Document Uploaded. Document: **VIDEOSARCH-ITLabsApplication.docx** (https://gateway.jpl.nasa.gov/), posted 8 hours ago.
- Wong, Wayne H (172E) -> SharePoint Development:** 1 Document Uploaded. Document: **embedVideo.pptx** (https://gateway.jpl.nasa.gov/), posted 23 hours ago.
- Dahl, Luke B (172E):** 1 Document Uploaded. Document: **pptEFBC.pptm %5BAutosaved%5D.pptm** (https://gateway.jpl.nasa.gov/), posted 24 hours ago.
- Ma, Ricky W (172E):** 2 Images Uploaded. Posted 5 days ago.
- Ma, Ricky W (172E):** 2 Images Uploaded. Posted 5 days ago.

Sidebars include 'My Profile' (with links to edit profile, links, colleagues, and memberships), 'Documents' (Personal and Shared), 'Pictures' (Portfolio and Shared), 'Lists' (Calendar and Information), 'My Links' (Useful Links and Add/Manage Links), 'Memberships' (Distribution Lists like edo-mgt, nen_transition, usaf_km_external, etc.), and 'Colleagues' (Grid of colleague profiles like Arca, Baerg, Bleiler, Burdick, Cahill, Campbell, etc.).

- JPL social networking site
- In addition to sharing your status, shares your uploaded work with colleagues



Others Resources



- **Training (Learning Management System)**
- **JPL Story**
- **JPL 101**
- **Speaker Series**
 - Von Karman lectures
 - Caltech Management Association lectures
- **Cost Estimating templates**
- **iPics Enterprise Resource Planning**
- **New Technology Reporting System**
- **Team X (Mission Design Center)**
- **Left Field (early mission concept design)**
- **Mechanical Design Center**