



**PREFERRED
RELIABILITY
PRACTICES**

**PRACTICE NO. PD-ED-1215.1
PAGE 1 OF 4**

PRELIMINARY DESIGN REVIEW

Practice:

Conduct a formal Preliminary Design Review (PDR) at the system and subsystem levels prior to the start of subsystem detail design, to assure that the proposed design and associated implementation approach will satisfy the system and subsystem functional requirements.

Benefits:

The PDR will provide for increased assurance that the proposed design approach, and the manufacturing and test implementation plans, will result in an acceptable product, with minimal project risk.

Programs that Certified Usage:

The PDR process has been used on all JPL-managed projects and science instrument tasks, including Ranger, Mariner, Voyager, Galileo, Magellan, Topex/Poseidon, MLS, WFPC, and numerous other science instrument tasks.

Center to Contact for Information:

Jet Propulsion Laboratory (JPL)

Implementation Method:

The responsible project/task manager defines the need for, and initiates the action for conducting a formal review by contacting the convening authority (generally the next higher management level). The convening authority, in consultation with the responsible manager, appoints the review board and a chair, and defines the board charter and schedule.

The review board, under direction of the chair, will conduct the review, and will prepare a written report to the responsible manager of the findings and recommendations. The board may elect to use the JPL Recommendation For Action form (RFA) to document recommendations, which are advisory and are not direction to the manager. The responsible manager will prepare a written response to the convening authority addressing the disposition of the review board findings and recommendations for action. The convening authority will review and approve these dispositions.

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PRELIMINARY DESIGN REVIEW

PDR Agenda. The following items and issues should be addressed at the PDR. (It should be noted that all items may not apply in all cases, and that additional items may apply in some cases.)

1) Functional description and block diagram	
2) Functional requirements and compliance of the design	
3) Subassembly/subsystem Functional Requirements Review Action Items and disposition	
4) Accuracy requirements and compliance of the design	
5) Interface requirements and compliance of the design	
6) Mass requirements and compliance of the design	
7) Memory requirements and compliance of the design	
8) Environmental requirements and compliance of the design	
9) Project single point failure (SPF) policy and compliance of the design	
10) Reliability requirements and compliance of the design	
11) Safety requirements and compliance of the design	
12) Maintainability requirements and compliance of the design	
13) Electronic piecepart requirements and compliance of the design	
14) Make or buy decision and rationale	
15) Inherited hardware/software and compliance with project requirements	
16) Spares requirements and plans for compliance	
17) Quality Assurance requirements and plans for compliance	
18) Software Assurance requirements and plans for compliance	
19) Reliability analyses requirements and plans for compliance	
20) Safety analyses requirements and plans for compliance	
21) Documentation requirements and plans for compliance	
22) Support equipment requirements and plans for compliance	

PRELIMINARY DESIGN REVIEW

23) Structural analysis requirements and plans for compliance	
24) Thermal analyses requirements and plans for compliance	
25) Calibration requirements and plans for compliance	
26) Testability requirements and plans for compliance	
27) Qualification test requirements and plans for compliance	
28) Acceptance test requirements and plans for compliance	
29) Development schedule and constraints	
30) Long-lead parts requirements and procurement plans	
31) Manufacturing and test facility requirements, availability, and acceptability	
32) Environmental test facility requirements, availability, and acceptability	
33) Hazardous operations facility requirements, availability, and acceptability	

The PDR allows for an assessment of the design and plans by a group of knowledgeable persons not directly involved in the activity being reviewed. A formal review can focus many years of experience on the subject at hand.

Technical Rationale:

The PDR aids the responsible manager in evaluating the quality of the work, and in making important decisions, including those concerning completion of critical milestones. The review process should aid in the identification of problems, and the evaluation of design approaches and options.

PRELIMINARY DESIGN REVIEW

Impact of Nonpractice:

One or a number of potential problems which could result in an adverse impact on the system, subsystem, and/or project might not be identified in a timely manner. This oversight might later result in a condition having a significant effect on quality, reliability, capability, schedule, and/or cost.

References:

JPL Standard Practice Instruction (SPI) 4-16-1.

JPL D-363 Guidelines for Planning and Conducting Formal Reviews