# Preliminary Design Review (PDR)

## Summary Description:

The Preliminary Design Review (PDR) is a formal inspection of the high-level architectural design of an automated system and its software, which is conducted to achieve confidence that the design satisfies the functional and nonfunctional requirements and is in conformance with CMS' enterprise architecture. Overall project status, proposed technical solutions, evolving software products, and associated documentation are reviewed at a high level to determine completeness and consistency with CMS standards, to raise and resolve any technical and/or project-related issues, and to identify and mitigate project, technical, security, and/or business risks affecting continued detailed design and subsequent development, testing, implementation, and operations & maintenance activities.

## Status:

**Mandatory -** The Preliminary Design Review (PDR) is the second of three critical checkpoints in the CMS Integrated IT Investment & System Life Cycle Framework. All system development and major application enhancement projects (including GOTS and/or COTS integrations) must conduct a PDR to ensure that the automated system or application being designed is in conformance with CMS' enterprise architecture and design standards. The actual conduct of the PDR will be somewhat dependent on the specific circumstances of the IT project.

## Timeframe:

The Preliminary Design Review (PDR) is performed during the Design & Engineering Phase when the System Developer has initially baselined the high-level system architectural design.

## Responsible Reviewing Component:

OIS/ISMG is the CMS component that has primary responsibility for the Preliminary Design Review (PDR) and ensuring that the high-level system design aligns with CMS' Enterprise Architecture. OIS/PMSG has primary responsibility for ensuring that the PDR is appropriately conducted.

## Primary Information Exchange Partners:

The following are the primary stakeholders who participate or have an interest in the Preliminary Design Review (PDR):

System Developer
System Owner/Manager
Project Owner/Manager
Component Lead
OIS/ITAPS

OIS/EDG
OIS/ISMG
OIS/PMSG
OIS/SSG
OIS/TMG
IT Infrastructure Implementation Agent or Contractor
IV&V Contractor
CBC/BISG/DWPM (Internet-facing systems only)
Chief Technology Officer (CTO)
Executive Steering Committee (ESC)

**Government Responsibilities:**

The Project Owner/Manager works with their designated Component Lead to ensure completion of the entrance requirements for the Preliminary Design Review (PDR). The first step is to complete the PDR Questionnaire (Excel Spreadsheet) to determine readiness to proceed to the PDR and availability of the input documents (see below). The Component Lead collaborates with OIS/ISMG in determining readiness for the PDR, and can assist the Project Owner/Manager in preparing the agenda, scheduling, and facilitating/managing the PDR. If a system is being developed in-house without outside contractor resources, then the government developers are responsible for the contractor responsibilities described below.

Representatives from the key stakeholder groups within the Office of Information Services (OIS) are responsible for reviewing the input documents prior to the PDR and being prepared to present any critical issues during the PDR. The OIS stakeholders are responsible for ensuring that assumptions, constraints, priorities, issues and risks based on their individual areas of subject matter expertise are identified and addressed during the PDR as appropriate.

Within one week following the PDR, the participants and the stakeholders are to send their comments to the Component Lead using the Comment Form. The Component Lead consolidates, collates, and sorts the comments by priority, page, and paragraph. Comments regarding the PDR process should not be included in the consolidated comments.

Upon completion of the PDR session(s), the Component Lead is responsible for ensuring completion of the PDR Exit Form (Word Document) by all of the key OIS stakeholder groups and for tracking all critical issues to closure. The Project Owner/Manager is responsible for tracking and resolution of all other actions resulting from the PDR.

If appropriate, the Component Lead should offer to schedule and lead a PDR follow-up discussion between the Project Owner/Manager and the PDR stakeholders to discuss Priority 1 and 2 comments and corrective actions. Final written responses to the comments are generally expected to be provided by the Project Owner/Manager within one week of that meeting, and shared with all of the PDR participants and stakeholders.

The Component Lead is responsible for providing the completed PDR Exit Form and consolidated comments to the Chief Technology Officer (CTO), who will represent OIS

at the Executive Steering Committee (ESC). The Project Owner/Manager and the Component Lead should also attend the ESC meeting to discuss the results of the PDR. The ESC will make a go/no go decision based on the recommendations provided by the CTO and the Project Owner/Manager. In cases where no ESC exists, the CTO will make the go/no go decision.

### Contractor Responsibilities:

The following are the responsibilities that the System Developer has with regard to the PDR. If a contractor is tasked with developing the system, then these are the responsibilities of the development contractor. If the system is being developed in-house, then these are the responsibilities of the government developers.

The System Developer who has technical knowledge of the proposed system architecture and the input documents shall:

1. Complete the PDR Questionnaire (Excel Spreadsheet) prior to requesting a PDR.
2. Provide a high-level presentation to CMS stakeholders that addresses the following:

    a. **Project Overview -** Identification of overall project scope (includes Work Context Diagram from the Requirements Document) and schedule (includes emphasis on high-level milestones and the Release Plan if applicable);
    b. **Design Drivers & Alternatives Considered -** Identification of assumptions, constraints, priorities, key driving requirements, alternatives considered and associated limitations/advantages of each design alternative considered, which led to the proposed technical solution;
    c. **System Architectural Design -** Identification of key hardware, software (includes COTS and GOTS), networking, telecommunication, and security components of the proposed system design, as well as all internal and external interfaces, and their relationships to each other depicted in a Communications Flow Diagram;
    d. **Software Architectural Design -** Identification of all Computer Software Configuration Items (CSCIs), Computer Software Components (CSCs) and Application Programming Interfaces (APIs) to include type, purpose and function for each; the interfaces, messaging, and protocols for those elements; and rationale for the software architectural design;
    e. **Requirements Traceability -** Demonstration of backward traceability of the system and software architectural designs to the functional and non-functional requirements (i.e., reference Requirements Traceability Matrix provided in the System Design Document [SDD]) with focus on any requirements not met by the design;
    f. **Data Overview -** Description of data flows, data stores, data transformations and the logical and physical data models (if applicable), including identification of any privacy concerns;
    g. **Enterprise Architecture Compliance -** Identification of any deviations from or non-compliance with the CMS Enterprise Architecture, CMS Design Standards, and Section 508 (Word Document);

h. **Resource Sizing Estimates** - Identification of anticipated number of users and their roles, and projected estimates of system resource needs for processors, memory, on-line storage, auxiliary storage, communications and network capacity;
i. **Risks & Mitigation Strategies** - Identification of project, technical, security, and/or business risks with proposed mitigation strategies; and
j. **Issues** - Identification of project and/or technical issues that require resolution.

3. Document the results/outputs from the PDR that are described below.

## Entrance Criteria/Inputs:

The following artifacts are mandatory prerequisites to the Preliminary Design Review (PDR):

- Business Risk Assessment from Business Case Analysis (BCA)
- Requirements Document
- System Design Document (SDD)
- Initial version of Information Security (IS) Risk Assessment (RA)

NOTE: At the time of the PDR, the detailed design portion of the SDD is not required.

Other artifacts that may also be prerequisites to the PDR, depending on the specific IT project being addressed, include:

- Logical Data Model
- Interface Control Document (ICD)
- Database Design Document
- Release Plan
- System Security Plan (SSP)

All prerequisite artifacts are to be provided to all of the PDR participants at least two weeks prior to the scheduled PDR session.

## Exit Criteria/Outputs:

The following are the results/outputs that are to be documented from the Preliminary Design Review (PDR):

a. Assumptions
b. Constraints
c. Priorities
d. Issue Resolutions (if obtained, though this is not to be the focus during the PDR session; emphasis should be on identifying issues, not resolving them during the PDR session)
e. Unresolved Issues (prioritized as Critical (show-stoppers) or Non-Critical [opportunities for improvement])
f. Risk Mitigation Strategies
g. Recommendations

h. Action Items
i. Next Steps

All comments received from the PDR participants and stakeholders are to be recorded in the Comment Form and sorted by priority, page, and paragraph.

Another output of the PDR is the PDR Exit Form (Word Document) that contains signatures from all of the representatives of the key OIS stakeholder groups and any documented critical issues they have identified that must be resolved before the IT project can move forward with detailed design and development activities. If no critical issues are identified by a key OIS stakeholder group, then the representative's signature indicates concurrence for the IT project to continue moving forward.

**Guidance:**

A best practice is to perform a Requirements Review prior to conducting a Preliminary Design Review (PDR).

**Review Process:**

The Project Owner/Manager has the System Developer complete the PDR Questionnaire and then submits the completed questionnaire to the designated Component Lead along with the appropriate entrance artifacts. The Component Lead will coordinate with OIS/ISMG to schedule the PDR, if one is warranted, and will notify the OIS Group Directors accordingly. The PDR will be conducted as one or more iterative review sessions attended by all of the key OIS stakeholder groups, the System Developer, the Project Owner/Manager, the System Owner/Manager, and the Component Lead. Additional participants may include CMS' IT Infrastructure Implementation Agent or Contractor, IV&V Contractor, and/or the Chief Technology Officer (CTO). The Component Lead in conjunction with the Project Owner/Manager and System Developer document the results/outputs of the PDR and follow-up to ensure that all actions and any unresolved issues identified during the PDR are satisfactorily addressed. The Component Lead ensures completion of the PDR Exit Form by all of the key OIS stakeholder groups and submits the completed form to the Chief Technology Officer (CTO). If an Executive Steering Committee (ESC) exists for the IT project, then the Component Lead, Project Owner/Manager and CTO will provide a summary of the results from the PDR along with an overall OIS recommendation to the ESC in determining a go/no go decision for the IT project to continue moving forward. All "Critical" issues must be resolved before the IT project can proceed with detailed design and development activities. See PDR Process for a graphical depiction of the PDR process flow.

**Data Created/Modified:**

August 2004/May 2005

# Preliminary Design Review (PDR) Process

Text Version