

# **Preliminary Design Reviews Project: SAPHIRE 8**

September 2011



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# **Preliminary Design Reviews Project: SAPHIRE 8**

**September 2011**

**Idaho National Laboratory  
Idaho Falls, Idaho 83415**

**<http://www.inl.gov>**

**Prepared for the  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555  
Project No. V6059**

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## REVISION LOG

<b><u>Revision Number</u></b>	<b><u>Effective Date</u></b>	<b><u>Affected Pages</u></b>	<b><u>Description of Change</u></b>
0	04/22/2011	0	Initial

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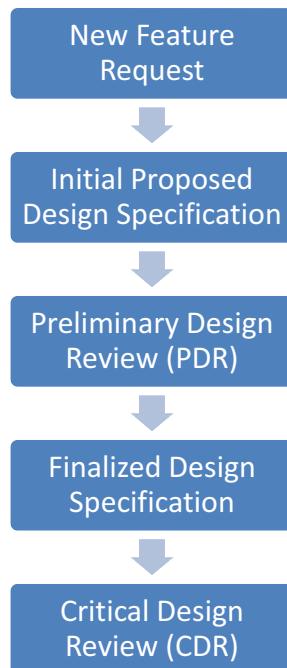
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## 1. Preliminary Design Reviews

### 1.1 Introduction

The Preliminary Design Review (PDR) is intended to be performed at the conceptual phase of a design request. The design request is initiated with a Design Specification document which includes a problem statement, design details, a design checklist and supporting documentation and/or projected sample output. In addition to this, the design specification has a chapter devoted to the completion of the Preliminary Design Review. This document describes the process of documentation of the PDR in the Design Specification.

A PDR is meant to ensure that the customer and developer are in agreement with the proposed design before major work is performed on the design. The customer requests a new feature for SAPHIRE 8 through a variety of means such as a NRC Form 173. Conceptualization work is performed through communication between the project owner, customer and developer to develop the proposed design. The PDR is performed once the Design Specification is produced. The Design Specification is both the formal document describing the design in detail and a detailed record of iterative changes. For every design review a new revision of the Design Specification will be produced. Multiple PDRs may be performed as an iterative process to finalize the design specification before major work is performed on the design.



Once the PDR is completed and the design is deemed satisfactory, the new feature is developed to the point of perceived completion by the project owner. The completed design is then run through the critical design review (CDR) process until the design is accepted for implementation.

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## 1.2 Design Requests

The design request arises from a need either perceived as a new feature or one that is meant to enhance a current feature of SAPHIRE 8. The design request is agreed upon initially in draft by the NRC and the developer after which a design specification is written.

## 1.3 Design Specification

The design specification is produced both to describe the enhanced feature requested and to document the iterative process of the PDRs and the CDRs performed prior to implementing the design into SAPHIRE 8. As a minimum, the design specification consists of the following sections:

- Introduction
  - Includes the problem statement, supporting paragraphs explaining why the design is needed and what the goals are of the design.
- Design Details
  - Covers the proposed functionality of the enhancement
  - Includes projected screen shots, forms, and/or reports
- Design Checklist
  - Lists each change to the software that is required to make the entire requested enhancement a reality
    - These checklist items become the requirements used in the requirements traceability matrix for the design change
- Revision Log
  - Documents the iterative process of design specification and design reviews
- Preliminary Design Review
  - Documents the iterative PDR process and also documents the acceptance of the preliminary design
- Critical Design Review
  - Documents the iterative CDR process and also documents the acceptance of the final design

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- Appendices
  - Proposed reports, screenshots, etc...

## 1.4 Preliminary Design Review Process

The PDR is accomplished through email and/or phone calls between as a minimum the following individuals/representatives:

- NRC Technical Staff
- SAPHIRE Project Principal Investigator or other Key Personnel
- SAPHIRE Project Software Quality Assurance Personnel

All required PDR group representatives must agree in writing (email is sufficient) that the proposed design is satisfactory to move forward to critical design stage. The PDR iterative process is annotated in the Design Specification document as accepted or to what is rejected and needs worked on. The PDR will be documented as a living documentation until acceptance.

The design needs to be assessed for need, cost, the programming language's capability, and the resources available to accomplish the task in the time period requested.

A signature table for each design review will be part of the design specification:

**Table 1: Preliminary Design Review Signature Table**

Preliminary Design Review # 1				
Reviewer	Name	Date	Appraisal Status*	Notes (Explain status if necessary)
NRC Technical Staff				
SAPHIRE Project Principal Investigator or other Key Personnel				
SAPHIRE Project Software Quality Assurance Personnel				
* Appraisal Status: 1=Accepted as is, 2=Accepted with minor modifications, 3=Rejected				

The table can be repeated as many times as necessary to document each iterative process until there is complete agreement of accepted or accepted with minor modifications. This table can be signed electronically by referencing supporting documents such as emails received that can be placed in the document below the signature table. The updating of the signature table electronically will be performed by the design specification document's owner. The owner will be the Project Principal Investigator (PI) or whomever the PI assigns to this task.

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### 1.4.1 Minor Modifications

A minor modification is one that would not prevent the design from moving forward to completion phase. The definition of a minor modification is one that does not change the function of the design. For instance, re-naming a choice in a pull-down menu would be a minor modification. Adding a new choice in a pull-down menu with a completely different report result would not be a minor modification. The notes section should explain the modification so that others in the approval group can agree or disagree.

### 1.4.2 PDR Iterative Process

The PDR iterative process is a documentation of the communication between the development team. It is not expected that every conversation be recorded within this process. What should be recorded is every point at which the design is presented as ready to start the major development phase, where all the features desired are identified, but not yet developed.

A new revision of the design specification is presented for each newly requested PDR.

The response from the design development team is annotated in the table under the Preliminary Design Review chapter. Prior responses for prior revisions are kept as a record. Response emails or phone conversation dates are annotated in Notes or below the table. Keep all as a running record of the PDR process.

Once a PDR has acceptance from all parties it is considered closed and the design moves on to the final development phase of which the Critical Design Review will be performed on before the design is implemented into SAPHIRE 8.



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## 2. Appendix

### 2.1 Design Specification Template

A design specification template is provided on the following pages.

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Date

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# Title of Design being Specified

---

Subtitle of design being specified.

By Authors of the Design Specification

---

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## Chapter

**1**

# Introduction

## Problem Statement

Description of the problem being addressed can be described in any manner useful to the initiator of the design specification. This can include history, screenshots, results of current problem areas, etc...

## Chapter

**2**

# Design Details

Design can be described in any manner useful to the initiator of the design specification.

## Chapter

**3**

# Design Checklist

This section will create the design's requirements.

A check (☑) indicates an option that is completed as of the 8.X.X.XX release.

- ☐ Requirement 1
- ☐ Requirement 2
- ☐ Requirement N
  - Sub requirement to Requirement N

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## Chapter 4 Revision Log

Initial draft completed \_\_\_\_\_

## Chapter 5 Preliminary Design Review

If multiple PDRs are required for acceptance, save the signature table and documentation and add the next PDR.

Preliminary Design Review # 1				
Reviewer	Name	Date	Appraisal Status*	Notes (Explain status if necessary)
NRC Technical Staff				
SAPHIRE Project Principal Investigator or other Key Personnel				
SAPHIRE Project Software Quality Assurance Personnel				

\* Appraisal Status: 1=Accepted as is, 2=Accepted with minor modifications, 3=Rejected

Documentation: List emails, phone conversations, etc... that document the appraisal status of the design by the reviewers.

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# Chapter 6 Critical Design Review

If multiple CDRs are required for acceptance, save the signature table and documentation and add the next CDR.

Critical Design Review # 1				
Reviewer	Name	Date	Appraisal Status*	Notes (Explain status if necessary)
NRC Technical Staff				
SAPHIRE Project Principal Investigator or other Key Personnel				
SAPHIRE Project Software Quality Assurance Personnel				

\* Appraisal Status: 1=Accepted as is, 2=Accepted with minor modifications, 3=Rejected

Documentation: List emails, phone conversations, etc... that document the appraisal status of the design by the reviewers.