

# Advanced Photon Source

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## APS Design Review

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- No changes made to this procedure since the last review

### Prepared by:

J. Cross, AES

### Reviewed by:

P. Fernandez, XSD/Associate Division Director  
N. Sereno, ASD/DIA Group Leader  
S. Davey, AES/Technical Operations Specialist  
T. Fornek, APS-U/Deputy Project Manager

### Approved by:

AES Division Director  
XSD Division Director  
ASD Division Director  
PSC/Deputy ALD-Science  
PSC/Deputy ALD-Operations  
PSC/Safety Manager

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## APS Design Review

### 1 INTRODUCTION

#### 1.1 Purpose

Evaluate new or modified designs of systems and components to ensure they meet technical objectives and will have no adverse effects on safety or operations.

#### 1.2 Scope

This procedure applies to new designs and modifications to existing designs of systems or components to be installed at APS, including mechanical, pressure, cryogenic, electrical, software, safety and shielding.

This procedure applies to designs created by internal and external parties.

Consistent with Argonne National Laboratory Quality Assurance Program Plan (QAPP), APS management uses a graded approach to determine the appropriate scope and level of formality for a design review. Depending on the complexity and potential impact on the APS, a review may be conducted by, for example, a steering committee, a standing safety committee, an external review panel, or an individual.

Any improvements or modifications to an APS safety system must follow a formal review process.

#### 1.3 References

- [Argonne Document Center](#)
- [Argonne National Laboratory Quality Assurance Program Plan \(QAPP\)](#)
- [APS Conduct of Operations Manual \(APS 1180311\)](#)
- [BSDRSC Charter \(APS 1194904\)](#)
- [SCDR Charter \(APS 1198251\)](#)
- [RSSCDR Charter \(APS 1198246\)](#)

#### 1.4 Definitions

##### 1.4.1 Radiation Safety System (RSS) Component

For the purpose of this procedure a component or system used to provide radiation protection for personnel is considered a *Radiation Safety System (RSS)*.

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## 1.4.2 Subject Matter Expert (SME)

An SME is a person who is an authority in a particular area or topic.

## 1.4.3 Beamline – Front End Safety Design Reviews

APS management has chartered a standing steering committee, the Beamline Safety Design Review Steering Committee (BSDRSC), to coordinate formal pre-installation design reviews for APS beamlines and front ends. According to its charter, this steering committee oversees reviews of all safety and facility operational aspects of the designs. Designs created within APS divisions will normally have passed technical and safety design reviews within the division before they are brought to the BSDRSC.

## 1.4.4 APS Safety Committee for Design Reviews (SCDR)

Standing safety committee that evaluates designs to ensure they meet APS and Argonne safety standards.

## 1.4.5 APS Radiation Safety Shielding Committee for Design Reviews (RSSCDR)

Standing safety committee that evaluates designs of radiation shielding systems used for personnel protection and provides the APS and the APS User Community with technical advice on radiation safety and shielding design.

## 1.4.6 Project Manager

The Project Manager is the individual responsible for executing a project. This may be an engineer, beamline scientist, MCR Chiefs of Operation, group leader, or associate division director. In the case of a BSDRSC review, the Project Manager may be a member of an APS partner institution.

## 1.4.7 Integrated Content Management System (ICMS)

ICMS is the electronic repository for APS records.

## 2 RESPONSIBILITIES

Responsibilities concerning implementation of design reviews as defined in this procedure are as follows:

### 2.1 Associate Laboratory Director

The Associate Laboratory Director will:

- provide final approval of the design review process as described in the Argonne QAPP and the APS Conduct of Operations Manual; and
- identify and provide final decisions for projects that require ALD design approval.

## 2.2 Division Director

### 2.2.1 APS Division Directors

All APS Division Directors:

- approve and document designs developed within their divisions except as noted for beamlines, front ends, and designs that require ALD design approval; and
- provide for oversight evaluations of the design review process.

Division Directors may:

- designate an Associate Division Director, a Group Leader, or an Individual to be responsible for design approval and oversight of design reviews on a one-time or continuing basis.

The Division Director or Designee will:

- assess the significance and the potential impact of new designs or design changes to ensure the formality of the design review, if any, is appropriate for the project risk;
- identify a Project Manager for every project requiring a design review;
- assure that design reviews are properly conducted and documented in accordance with the Argonne QAPP and this procedure.

The Division Director or Designee may:

- charge a steering committee to organize a formal design review;
- charge an ad hoc committee, a standing committee, or an individual to perform the review in lieu of a steering committee if a less formal review is justified, for example if the design uses conventional technology and has low potential consequence to APS operations;
- add individuals to the review committee based on the potential impact of the design, the need for additional subject matter expertise, or in case of conflict of interest.

### 2.2.2 Additional Responsibilities of the AES Division Director

In addition to the above responsibilities, the AES Division Director:

- is responsible for safety and facility operational issues associated with beamline designs by non-APS designers/engineers;
- provides safety oversight of beamlines, including all RSS components for beamlines and front ends; and
- approves beamline and front end RSS and safety designs and modifications.

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## 2.3 Associate Division Directors and Group Leaders

Associate Division Directors and Group Leaders are responsible for bringing to the attention of the Division Director any new or significantly expanded projects, in order to agree on the appropriate level of oversight.

## 2.4 Project Manager

The Project Manager will:

- ensure ES&H and QA/QC requirements are addressed by the design;
- provide adequate documentation for design reviews;
- coordinate presentations to the reviewers; and
- prepare a response to findings and recommendations from design reviews.

## 2.5 Review Committee

For the purpose of this procedure, the committee charged with conducting or coordinating a design review will:

- assure that the level of the review is commensurate with the complexity of the design, and that all safety aspects of the design are considered;
- require a review by the RSSCDR for all radiation safety shielding designs;
- charge the SCDR, other standing safety committees, and additional subject matter experts, as needed, to review specific aspects of the design; or, for limited scope reviews, conduct the review with participation limited to those committee members required for an adequate review;
- combine the outcome of all reviews and reconcile any differences.

The Committee Chair will:

- provide an advisory report to the review requestor, according to the charge;
- express all concerns from reviews in the form of numbered recommendations, each beginning with an action verb [should the committee feel that further consideration of an issue is needed, “consider” is an appropriate action verb];
- identify in the report any recommendations that were not adopted, including the justification; and
- file the review report, all safety committee and SME reports, any review meeting minutes, and the reviewed design documentation in ICMS.

## 2.6 Division Quality Assurance Representative (QAR)

QARs participate in design reviews as follows:

- determine if adequate acceptance criteria for quality verification are specified in the design drawings and specifications;
- recommend improvements or corrections to the acceptance criteria; and
- verify QA recommendations have been satisfactorily addressed.

## 3 DESIGN REVIEW PROCEDURE

### 3.1 Overview

The design review procedure consists of a series of evaluations to determine the adequacy of a design in meeting its performance, safety and operational objectives.

### 3.2 Design Review Procedure

The design review procedure is a hierarchically organized information flow from the Project Manager, through the Division Director to the review panel or steering committee. The review process steps are:

| Step |                               | Task   |
|------|-------------------------------|--|
| 1    | Project Manager               | 1. Submit a request for design approval, along with the design documentation, to the appropriate Division Director or designee.  |
| 2    | Division Director or designee | 1. Evaluate the design;<br>2. As needed, charge, for example, a committee or an individual, to perform a design review with the appropriate level of formality   |
| 3    | Committee                     | 1. Evaluate the design documentation;<br>2. Arrange for Project Manager presentations, as required;<br>3. Review the design; request additional reviews by the appropriate standing committees and SMEs, as required   |
| 4    | Committee Chair               | 1. Combine the input from committee members, safety committees, and SMEs;<br>2. Notify the Project Manager if clarification or additional information is required;<br>3. Notify in writing the Project Manager, the Project Manager's line management, and the review requestor if, during the course of the review, the Committee seeks prompt corrective action; |
| 5    | Project Manager               | 1. Upon request, provide the review committee with additional information or clarification.  |
| 6    | Committee Chair               | 1. Provide an advisory report to the review requestor; and<br>2. File the design documentation in ICMS and review report in ICMS.  |
| 7    | Division Director or designee | 1. Approve or reject the design;<br>2. notify the Project Manager of the decision; and<br>3. file a copy of the approval in ICMS.  |

|   |     |   |
|---|-----|---|
| 8 | ALD | <ol style="list-style-type: none"> <li>1. Provide final approval for projects identified as requiring ALD design approval;</li> <li>2. Notify the Division Director(s) of the decision; and</li> <li>3. Save a copy of the approval in ICMS.</li> </ol> |
|---|-----|---|

### 3.3 Additional Requirements for Beamlines and Front-Ends

The Project Manager submits the design documentation, along with records of any prior technical and safety reviews of the design to the AES Division Director for approval to install. The AES Division Director will utilize the BSDRSC to coordinate a safety design review.

RSS component designs that are different from existing approved designs or that will be used in a different context will be submitted at the conceptual level to the AES Division Director. The AES Division Director may choose to have the committee review the concept before further design work is done. In any case a final design review of RSS components will also take place prior to installation, unless such a requirement is waived in writing by the AES Division Director or designee.

## 4 DOCUMENTS/RECORDS CREATED BY THIS PROCEDURE

| Description of Document/Record                        | Custodian   | Storage Location | Retention Requirement   |
|---|---|------------------|---|
| Designs and supporting documents submitted for review | AES for beamline/front end designs, and the requesting division for other designs | ICMS             | 5 years after design approval or until the equipment/facility is removed - whichever is later |
| Review meeting minutes                                |   |                  |   |
| Design review reports                                 |   |                  |   |
| Design approvals                                      |   |                  |   |

## 5 FEEDBACK AND IMPROVEMENT

If you are using this procedure and have comments or suggested improvements for it, please go to the [APS Policies and Procedures Comment Form](#)\* to submit your input to a Procedure Administrator. If you are reviewing this procedure in workflow, your input must be entered in the comment box when you approve or reject the procedure.

Instructions for execution-time modifications to a policy/procedure can be found in the following document: Field Modification of APS Policy/Procedure ([APS\\_1408152](#)).

\* <https://www1.aps.anl.gov/Document-Central/APS-Policies-and-Procedures-Comment-Form>