MaSEE
Management System for
Engineering Education

Design Review

A design review is an activity which provides verification of the design-to-date. Design reviews occur throughout the design process to increase confidence that relevant requirements are being incorporated and necessary activities are being undertaken. Design reviews confirm the design maturity is suitable to be used as the basis for further development, acting as a check to prevent immature designs from progressing. Effective design review reduces risk for the designer, customer and end-users.

Design reviews aim to identify or anticipate any issues or shortcomings with the design as early as possible in the design process so they may be addressed sooner rather than later. Design reviews should occur as soon as sufficient information exists to perform a meaningful review, allowing design changes to be economically incorporated into the design.

Design reviews should be undertaken by someone outside of the design process for the following reasons:

>   Independent review prevents vested interests within the project from promoting designs which will not achieve the required objectives.
>   Independent reviewers can provide a fresh perspective and identify issues that the designers are "too-close to see".

Design Review vs. Design Verification

Design reviews are themselves design verification activities; however, verification includes other activities, for example: prototyping and software modelling. Reviews can occur throughout the design process and there can be multiple design reviews for a design. Design reviews consider all the inputs and expectations the design team must work with and evaluates the design in relation to "fitness-for-purpose" as well as technical accuracy and validity.

What to Look for During a Design Review

Is the design generally fit-for-purpose and fulfils its specified requirements?
>   Are the required outcomes defined and understood by the designer?
>   Is the context of how the design will be used understood by the designer?
>   Are the design assumptions reasonable and justified?

Design cohesion (if something doesn't look right, it probably isn't)
>   Does the design interface with external systems?
>   Are there mixtures of different component types and systems performing similar functions?
>   Does anything look notably different or like an "after-thought"?

Design substantiation / technical risk management
>   Does the design meet the required function and performance?
>   Was it developed using a suitable method, by competent persons?
>   Is it accurate / has it been reviewed?
>   Is the function or performance of any system marginal?
>   Are there any novel / experimental systems or technologies incorporated in the design?

Safety
>   Have all foreseeable hazards that end-users will face, been identified and addressed?
>   Have any new safety issues or hazards been identified through design development?

Appropriately specified
>   Does the design documentation suitably describe/specify: assembly, testing, operation, maintenance, disposal of the design?
>   Do drawings contain sufficient information to manufacture/assemble components correctly?

Design Review Process

Design reviews are a planned and deliberate activity. Design reviews should not be confused with project progress meetings or day-to-day management.

Guidance on planning and conducting Design Reviews is provided in AS IEC 61160.

1. Allocate Roles
Technical Lead – Responsible for arranging the Design Review and addressing any actions resulting from the Design Review.

Facilitator – Responsible for chairing the Design Review. Should be independent.

2. Planning
Organise a time for the Design Review meeting.

Design Review materials (drawings, calculations etc.) shall be submitted to the reviewer at least 1 week prior to the review.

3. Design Review
Conduct the review in accordance with the agreed agenda.

Someone takes minutes (ideally: someone NOT involved with the review conversations).

4. Address Actions
Actions from the review shall be distributed via the review minutes.

The Design Manager is responsible they are addressed within the agreed period.

5. Review Gate
Once the review is complete and any outstanding actions have been responded to, the reviewer must determine whether the design is suitable to progress to the next phase of development.