QUICK GUIDE TO DESIGN VERIFICATION

MaSEE
Management System for Engineering Education

Design Verification

Design verification is characterised by activities that examine whether the outputs of a design process fulfil the originally-stated requirements. The purpose of design verification is to assess the adequacy (correctness, completeness, consistency, accuracy) of the design.

Verification should be planned at the beginning of a project. Requirements are written to be specific and measurable so that they can be effectively tested and verified later in the project.

Some questions asked during the verification process are:
> Will this design work, as per requirements?
> Is the design fit-for-purpose? That is: is each requirement fulfilled for the intended use?
> Are all the specified requirements addressed?
> Can the design be constructed as drawn?

A requirement may be verified in a number of ways, including:
> Review – Establish that design documents comply with requirements.
> Analysis – Calculation or analysis (e.g. software modelling) which demonstrates compliance with requirements.
> Test – Prototype, measurement or function testing to demonstrate compliance with requirements.

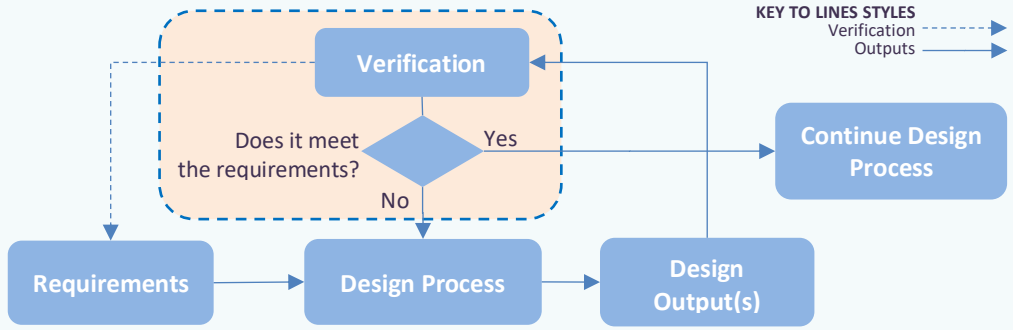
A single requirement may be verified using one or multiple methods.

Designer's Role

The role of the designer includes:
> Identifying the relevant requirements and addressing them in the design.
> Preparing design documentation including drawings, calculations, and the basis for decisions.
> Ensuring design documentation is accurate and complete.

This can be summarised as: Make the verifier's role dull and straight-forward.

Once verification is complete, a designer will need to take account of feedback to improve the design.



Verifier's Role

The role of a verifier includes:
> Establishing whether design outputs comply with stated requirements
> Confirming that conclusions made in design documentation are valid
> Checking whether final outputs are technically adequate
> Recording details and extent of verification activities carried-out
> Documenting details of corrections required

The verifier must have the competence (skills, qualifications and experience) to make reliable judgements and should be independent from the design activities (no conflict of interest). Independence increases objectivity and may assist to detect errors overlooked by those close to the design.

It is not the verifier's role to modify the design. The verifier should identify whether requirements have been fulfilled, and other shortcomings, and provide recommendations for improvement.

Documentation

There are many different document templates for verification. Template selection is based on a variety of factors including; the organisation's requirements, what is being designed, novelty of the design and technology, and the relevant specific codes, standards and legal requirements.

As a minimum, a verification template should include the following elements:
> What is being verified, including version of the design (and revision numbers of the drawings and documents being reviewed)
> When the verification is taking place
> Who is doing the verification
> Acceptance/rejection criteria
> What information (evidence) is used to make judgements about whether design fulfils the criteria
> Verification procedures, measures and techniques used
> Conclusions
> Recommendations to designer for correction or improvement

A tabular format is common.