



## Peer Review

Reviewing the work  
of another Engineer

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## Types of Review

In the context of reviewing the work of another engineer, there are four basic review categories, each with its own purpose and scope, and entailing particular responsibility for the reviewer. They are:

- Peer Review
- Design Review/Technical Review
- Regulatory Review
- The expert witness

They differ fundamentally and are discussed separately in the following sections, but some definitions are common to all.

**Work:** a scientific or technical paper or report; an engineering or scientific design; the implementation of an engineering or scientific project; the competency of a technical capability or qualification; an artistic or cultural product; or the management and financing of a project

**Designer/Author:** the person responsible for the work

**Client:** the person or body commissioning the review

**Peer Reviewer:** the person or persons undertaking the review

**Contract:** The document that defines the scope of the review, the basis of remuneration, and the responsibilities of the client, reviewer and designer

**Learned Society:** Professional Affiliated Institution, such as IPENZ

**Peer:** Person of equivalent expertise to the designer/author who has experience relevant to the work in question.

## Peer Review

### Purpose of Peer Review

The Peer Review is potentially the most complex kind of review both technically and ethically. The purpose of Peer Review can include comment on some or all of the following:

- whether the completed work has met the objectives set out for it
- other options that could have been included in the preliminary design
- whether the evaluation of options is rigorous and fair
- the validity of the assumptions
- the validity of the conclusions
- the process towards completion of the work
- the validity of the recommendations
- the objectives set out for the work
- adherence to relevant regulations and codes of practice
- the fitness for purpose of the work.

Peer Review may also be part of the design function, to consider elements of the design process, such as resources, the value engineering process, concept design, risk reviews and design methodology.

If the peer reviewer can have input into the scope of the work, the design process, project planning and the completed work review, this can lead to a more acceptable outcome for the client.

While the work is in progress, the peer reviewer can have review inputs at specified points, to aid the design process and avoid problems such as poor evaluation of options and incorrect

assumptions. The peer reviewer can act as an adviser to the designer, depending on how the process is managed; the liability implications of this arrangement are discussed later.

### Who can be a peer reviewer

A peer reviewer must be recognised by fellow members of the appropriate learned society as at least equal in experience and technical capability to the designer/author. Often the peer reviewer will have more experience of similar works than the designer/author.

The peer reviewer must be independent from the author's or designer's own organisation and have no financial or other interest in the outcome of the review. This requirement can be overridden if complete separation can be demonstrated between the peer reviewer's group and that undertaking the work, for example by means of a "Chinese wall".

The peer reviewer must disclose any conflicts of interest that could impair the independence of the review.

### The ethics of Peer Review

The peer reviewer must abide by the code of ethics of the appropriate learned society. They must avoid usurping the role of the designer or succumbing to professional jealousy.

The peer reviewer must report against only the criteria and restrictions that were put in place for the designer/author of the work.

The peer reviewer must respect the intellectual property made available in the course of the review, which often passes from one firm to another during the review process.

The peer reviewer must avoid using hindsight to make a point against the designer, and comment on the design relative to the state of knowledge at the time of the design.

### Scope of Peer Review services

#### Review of completed work

This is a basic service, in which the peer reviewer has no influence on the development of the work. The report establishes what is good, what is deficient and what other outcomes could have been developed.

#### Project Peer Review

This more complex task involves the peer reviewer in the development of the work. The peer reviewer is present at the setting of objectives, and reports throughout the development of the work, working closely with the designer/author of the work. Project Peer Review is provided for in the ASCE Standard Form Agreement for Independent Project Peer Review.

#### Competence Peer Review

Peer Reviews may also evaluate a professional's experience and capability in relation to their competence to undertake tasks as a member of a learned society. In this case, the peer reviewer can discuss the relevant experience with the individual concerned. Ideally, the qualifications and experience of the peer reviewer will be greater than those of the subject.

### Who appoints a peer reviewer

In most instances, the client who commissioned the work or design will appoint the peer reviewer, since the client has a vested interest in getting the work/design completed satisfactorily.

Often the client will select a peer reviewer from candidates nominated by the designer/author. The peer reviewer is assumed to be able to work with the designer/author in a context of trust and respect for intellectual property.

### Contractual arrangements

The peer reviewer should enter into a written contract for services with the client, including the following elements:

- the purpose of the review
- the objectives for the work or design given to the designer
- the scope of the review (limitations on numerical checking etc)
- the supply of all relevant documentation by the designer
- the lines of communication between designer and peer reviewer, and peer reviewer and client
- the reporting schedule for interim reviews
- the limit of the peer reviewer's liability, in contract and in tort, and whether the Consumer Guarantees Act 1993 is covered by the contract
- who apart from the client will use the review and for what purpose.

The peer reviewer reports to the client, and a courtesy copy goes to the designer with the client's consent. In particular, the report should include:

- who is entitled to rely on the report and under what circumstances
- the scope of the report
- the purpose of the report
- disclaimers
- qualifying statements as to work not undertaken, matters requiring further investigation, reliance on information provided by others, and assumptions made.

There is a close relationship between peer reviewer and designer, to ensure that all objectives and assumptions are included in the review. This closeness can be construed as an added responsibility under tort for the peer reviewer regarding the design outcome, and needs to be cleared with insurers.

### Design Review / Technical Review

Many forms of Design Review are undertaken by design organisations as part of their quality assurance programmes. They are mostly undertaken in-house, and can be similar in scope to a Peer Review. Reviews at defined stages of the work – for instance 10%, 50% and 90% of completion – are common for QA purposes.

The purpose of a Design Review is to check assumptions, design method, arithmetical accuracy and the conclusions drawn by the designer. The review will include compliance with regulations, laws, design codes and internal design methods. A Design Review is sometimes required to utilise a different design approach from that of the designer so as to test the acceptability of the design.

The independence of the peer reviewer is not an issue, and the peer reviewer can be a senior from the same organisation as the designer, or from another firm. If the design is from a licensed supplier of proprietary know-how, the peer reviewer will need to be conversant with this knowledge.

The peer reviewer commonly undertakes a thorough assessment of the work including numerical checking. Such a verification check forms part of the quality assurance programme of the design organisation.

There is a direct working relationship between the peer reviewer and the designer, and all assumptions, calculations and procedures are open for review. Intellectual property is not an issue. The review is reported back to the relevant project manager or design head, and reports are not meant to be made available outside of the designer organisation. It is recommended that the review be undertaken by another designer rather than the project manager, because the project manager has the role of reconciling differences should they arise.

### Regulatory Review

The purpose of a Regulatory Review is to assess whether the design complies with pertinent regulations, consent requirements and laws. The review does not assess the design objectives, process, options, assumptions or method, but only the submitted design, testing the outcome against regulatory parameters.

There is no direct relationship between the peer reviewer and the designer, although the designer may be asked questions about inconsistencies in the work. Access to the designer by the peer reviewer is important. An ethical consideration arises for the peer reviewer when there are concerns with the design. The peer reviewer should contact the designer to indicate any differences between the peer reviewer's documentation and the designer's design before the peer reviewer issues a report. This allows the designer to comment and state a position before the report is submitted.

The peer reviewer's role is to identify areas of the design that need to be addressed and to invite the designer to resolve them to the peer reviewer's satisfaction. The peer reviewer does not become involved in resolving the issues.

The peer reviewer may be from a regulatory office, or may be an independent designer engaged by that office to carry out the review, and report to the Regulatory office.

### The expert witness role

The role of an expert witness can be arduous and testing, and it involves many ethical issues that need to be carefully traversed. The expert witness is a servant of the court, not one of the parties, and therefore their advice must be unbiased, particularly with respect to the party who is paying for the witness's preparation and attendance.

The expert witness may be selected because of previous experience in the role of designer, or in evaluating works.

In the capacity of an expert witness, a peer reviewer is asked by legal counsel or the commissioner of an inquiry to advise the court on specified aspects of a work undertaken by another designer. The scope of the questioning to the expert witness can be as wide as the court deems relevant. The expert witness is not obliged to inform the designer of their engagement for this role, but it is courteous to do so. There is no direct relationship between the expert witness and the designer. The expert witness should comment only on the information received on the designer's work.

The expert witness should declare the ethical limitations on his/her comments frankly when asked if there are any conflicts of interest.

It is imperative that the expert witness should not exceed his/her experience in answering questions and keeps to the matter of the question. The court is more respectful of those who acknowledge their limitations.

The expert witness should act independently and not as an advocate for the party that has commissioned them. They must also be circumspect about using the benefit of hindsight.

The expert witness must avoid being judgmental and giving an opinion as to negligence. It is up to the court to determine negligence, since this is a legal matter.

Assisting in Disaster or Failure Reviews is similar to the role of an expert witness, as the purpose is to identify the contributing factors. The outcome of the review may be the establishment of a need for changes in design codes or regulations, even though all relevant design practices were followed in the work. If so, the peer reviewer is encouraged to contact the designer directly to discuss the design philosophy.

The role should not be construed as an opportunity for the peer reviewer to market his/her design skills at the expense of the designer, and comments must be made against accepted standards at the time of the design.

For further comment and advice on the role of an expert witness and court procedure, ACENZ Members are recommended to refer to the ACENZ Practice Notes B51 Evidence and Court Procedure April 2002, and B52 Expert Witness April 2002.

## Contractual Arrangements

The contractual documents relating to reviews can generally be prepared from the Short Form IPENZ/ACENZ documents for simple Peer Reviews and the other reviews.

For Project Peer Reviews, the ASCE Standard Form of Agreement between Owner, Designer, and Peer Reviewers for Professional Services for Independent Project Peer Review, amended for New Zealand use is a suitable document.

## Liability

In all the kinds of review discussed, responsibility for the work resides with the designer/author. If comments by the peer reviewer are adopted by the designer, the responsibility stays with the designer. However, the peer reviewer has been linked to the design responsibility under tort in some cases, and this

needs careful qualification when entering into the contract for services.

The authority requesting a Regulatory Review takes responsibility for the Compliance Certificate if one is issued. In the matter of Producer Statements, IPENZ has issued Practice Note 01, which discusses liability and conflicts of interest. ACENZ Members can refer to the ACENZ Practice Note B64 A Guide to Producer Statements May 1997.

The contract between peer reviewer and client needs to record whether the peer reviewer is:

- disclaiming all liability in contract and tort
- limiting liability in contract and tort to a certain sum of money
- contracting out of the Consumers Guarantees Act 1993.

## Summary and Recommendations

Reviewing the work of another engineer entails different responsibilities depending on the type of review. Peer Reviews are ethically the most onerous, demanding independence, respect for intellectual property and reporting against strict guidelines. For Peer Reviews to be the most effective, the peer reviewer should be engaged at the outset so that the design process can be assessed throughout the progress of the work. The peer reviewer is best selected by the client from a list supplied by the designer. Compatibility between peer reviewer and designer is imperative.

In Peer Reviews and Design Reviews the peer reviewer and the designer should have direct one-to-one communication.

Design Reviews and Technical Reviews are frequently undertaken in-house and should include arithmetical checking.

Regulatory Reviews are focussed solely on the outcome of the work, but have liabilities associated with certificates of compliance.

An expert witness has a duty of care to stay within his/her experience when reviewing another engineer's work. Detailed advice on the responsibilities of an expert witness and on court procedure is to be found in the ACENZ Practice Notes for ACENZ Members.

Conditions of Contract for Review Services can generally be prepared from the IPENZ/ACENZ Short Form documents. More complex projects can use the ASCE Project Peer Review contract.

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