



# Safety and Engineers

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The Institution of Professional Engineers New Zealand Incorporated (IPENZ) is the non-aligned professional body for engineering and technology professionals in New Zealand.

Practice Notes offer guidance to practising engineers by exploring issues of importance to the profession and setting out good-practice methodologies. They are written by practitioners and subject to peer review by IPENZ Members. While every care is taken in their preparation, these documents are not offered as formal advice. Any liability arising from their use rests with the practitioner.

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## Safety and Engineers: Health and Safety in Employment Act, 1992

This Practice Note is not intended to be a definitive guide to the Health and Safety in Employment Act 1992 but to raise awareness of issues that engineers in industry need to keep in mind and learn more about.

The Act has a hazard assessment and management philosophy. In 2003, a major amendment to the Act strengthened employee participation in health and safety issues in the workplace and also recognised stress as a hazard to be managed. Details of the changes can be found at [www.workinfo.govt.nz](http://www.workinfo.govt.nz).

The Act establishes liabilities for practitioners and this includes engineers in their various roles as employees and employers, and as designers and consultants. The Act imposes duties on these parties as well as on principals and those who control workplaces.

Case studies featured on the Occupational Health and Safety (OSH) website and in “Safeguard” magazine indicate that there are still issues with the Act’s application that clearly lag behind best practice.

### Outline of the Act: some definitions

**Purpose of the Act** – prevention of harm by promoting excellence in identifying and actively managing hazards.

**General duties of employers** – to take all practicable steps to ensure the safety of employees while at work. These steps include:

- **Hazard management** – systematically identify, assess, manage and monitor existing and new hazards. If assessment indicates that hazards are significant then they should be eliminated if practicable or isolated if not. Where elimination and isolation is not feasible, then employees are to be protected with suitable clothing and equipment.
- **Information** is to be given to every employee on emergency plans, identified hazards, location of safety clothing, devices, equipment and materials, and any health or environmental monitoring that is carried out. Information should be in a form and manner that the employee is reasonably likely to understand.

- **Training and supervision** – every employee has, or is supervised by someone who has, knowledge and experience in the work undertaken to ensure that it is not likely to cause harm either to themselves or others. Every employee is adequately trained in the safe use of all plant, objects, substances, and protective clothing and equipment they may use or handle.
- **Non-employees** – employers to take all practicable steps to ensure that people in the workplace and its vicinity are not harmed by any work hazard. This includes contractors, sub-contractors and members of the public.

### Duties of the participants

- **Employers to non-employees** must take all practicable steps to ensure that no action or inaction of any employee harms any other person.
- **Persons who control places of work** must take all practicable steps to ensure that no hazard harms any person either who works there or is in the vicinity with implied or express permission. (Note: The definition of control is the person with possessorial rights over the place of work or plant in it.) They must also take all practicable steps to warn others of any hazards.
- **Self-employed people** must take all practicable steps to ensure that no action or inaction they take while at work harms themselves or anyone else.
- **Principals** must take all practical steps to ensure that no contractor or sub-contractor or AN EMPLOYEE of a contractor/sub-contractor, is harmed while doing any work (other than residential) that they were engaged to do.
- **Employees** must take all practicable steps to ensure their own safety while at work and that no action or inaction of theirs while at work causes harm to anyone else. This now includes using suitable protective equipment supplied by the employer or by the employee.

### Standards and Codes of Practice

The Act defines processes whereby codes of good practice may be promulgated. These are typically a statement of preferred work practices, or “a statement of preferred aims, arrangements practices or principles”. Current examples include the Approved Code of Practice for Demolition, 1994 and the scaffolding code etc.

## Accidents

If an accident occurs and the resulting injury constitutes serious harm, full details are to be recorded in a Register of Accidents. If a person is seriously injured while at work, the accident scene must not be interfered with unless there is good reason to do so (such exceptions are defined in the Act). The minister may direct that an enquiry will be held before a district court judge. Similarly “near misses” that may have caused serious harm are also to be recorded in the Register and investigated.

## Inspectors

Inspectors have defined rights of entry and wide powers to gather evidence, take samples etc. They may issue *improvement notices* requiring compliance where the inspector believes the Act is not being complied with. In more extreme cases, where the inspector believes serious harm may result, a *prohibition notice* can be issued which may direct the withdrawal of staff.

## Offences and penalties

The most serious offences, i.e. where a person is aware that an action is likely to cause serious harm and does nothing to prevent it, is liable to a term of imprisonment of not more than two years or a fine of not more than \$500,000 or both. Lesser offences against other sections of the Act attract lesser fines.

## Implications for Engineers

### Construction

#### Roles under the Health and Safety in Employment Act 1992

(Note: Space does not permit expansion of the various section references. The Act can be found at <http://www.legislation.co.nz/> and it is strongly recommended that readers look up the various references.)

**Client:** Principal (section 18); person who controls a place of work (section 16).

**Engineer/Designer:** Employer (if using staff on site) whole Act applies; Principal (section 18); self-employed (section 17). Contractually, care should be taken not to assume other roles! (not to be confused with the formal role in contract administration).

**Head Contractor:** Employer, self-employed (section 17); Principal (section 18).

**Sub-Contractors:** Self-employed (section 17). If further subbing could be a principal (section 18). Note: Under the Act any party can have more than one role simultaneously. All on site can have the role of a “person” (Clause 49 – Offences and Penalties: “Any person”). The role of a person who controls a place of work appears to be linked in a recent court case to possessorial rights, and contracting out proved no defence.

Despite their limited role in the legislation engineers can have a significant influence on site safety:

- **Client advice:** Ensure the client is aware of their obligations and exposures under this legislation as both principal and person who controls the site. Ensure that the client does not try to contract out of their responsibilities.
- **Design:** The whole Act is predicated on the identification and management of hazards. By careful analysis, the designer, in partnership with the client and the construction team, can have a significant impact on the hazard level in construction. This is particularly true in the area of *elimination* of potential hazards by seeking alternative solutions and appropriate materials and by actively considering high-risk tasks such as work at height, steep-pitched roofs, foundation work, trenching and so on. A survey carried out on this topic by Site Safe indicated that while 80% of engineers believed they kept safety in mind in design, only 30% of constructors believed that they did.
- **Tendering and evaluation:** Insist, either in pre-qualification or in the contract documentation, that all contractors provide a hazard assessment and safety plan for dealing with the project or their role in the project. Make it clear in the documentation that safety is part of the selection criteria and that you expect the quote to include safe working practices. The client’s own site safety requirements should be included as part of the tender documents where these are available. Special care is required in brownfield environments where co-ordination with the principal’s operations is an issue.
- **Execution of the project:** As much as possible, ensure that all people on site are adequately trained, have completed a hazard identification process and have a site-specific plan to deal with these. Site Safe offers expertise and assistance to help facilitate this process. Safety should be the first agenda item of every project meeting

and regular checklist-based inspections should be carried out.

## Process/manufacturing

In the manufacturing environment, engineers are generally more likely to be employees. This to some extent obviates the individual liability under the Act, as any action will generally be against the company/ employer. However, this is not a reason for complacency as the OSH website shows that a number of prosecutions have been brought against employees. Some engineers will also be in a consulting role.

The process of the use of hazard identification and risk assessment to judge likely severity has become better understood and is frequently used. Engineers have a substantial role to play as part of this activity because they are trained in cause and effect thinking, and can predict a range of likely outcomes and their consequences.

A particularly important code is the "Approved Code of Practice for Managing Hazards to Prevent Major Industrial Accidents" published by OSH. This code has been written largely for organisations where process safety is an issue, with the potential for a major industrial accident. It also contains much value in the management of occupational safety.

Many tools exist for systematic evaluation of hazard and risk such as Task Analysis, HAZOP, HAZAN and FMEA. For more sophisticated plant and associated control systems, new tools have been developed that allow the calculation of safety integrity levels

etc. IEC 61508 is an international standard that provides methodologies for analysis and determining safety levels of protection required with a particular focus on software systems.

Site management controls are particularly important with appropriate procedures to ensure that plant is built to design, all modifications are appropriately evaluated and that appropriate commissioning and testing is carried out.

## Codes of Practice

Occupational Safety and Health Service of the Department of Labour now have numerous codes of practice and other guideline documents available. Many of these deal with construction activities. Specifically, the Act directs the courts to consider the codes that were available at the time of a transgression and familiarity with the codes will no doubt be a reasonable defence when the "all practicable steps" test (section 2a) is applied.

These are available as a free download from the OSH website.

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