



## Introduction

This glossary is intended as a quick reference to definitions of general safety terms which are in common usage. The definitions include those pertaining to functional safety in addition to general occupational health and safety matters.

The glossary is put forward as guidance only and is not claimed to be exhaustive.

The annotation in brackets after a term acknowledges the source of the definition, as below,

<b>(a)</b> BS 3138, 1992 Glossary of terms used in management services. 54 pp. BSI, 1992 ISBN 0-580-20215-1	<b>(e)</b> HSE Measures of workplace injury: <a href="http://www.hse.gov.uk/statistics/lfs/injury.htm">http://www.hse.gov.uk/statistics/lfs/injury.htm</a>
<b>(b)</b> BS 5304, 1988 (obsolescent) Code of practice for safety of machinery. 168 pp. BSI, 1988 ISBN 0-580-16344-X	<b>(f)</b> BS 5588. Fire precautions in the design, construction and use of buildings, various parts
<b>(c)</b> Ridley, J. Health and Safety at Work. 4th edition Butterworth-Heinemann, 1994. ISBN 0-7506-0746-7	<b>(g)</b> IEC 60050 International Electrotechnical Vocabulary. Searchable version at <a href="http://www.electropedia.org/">http://www.electropedia.org/</a>
<b>(d)</b> Hendy J. Redgraves (Health and Safety) Redgrave's Health and Safety. third edition. Butterworths, 1998. ISBN 0-406-89969-X	<b>(h)</b> Functional Safety of Electrical Electronic Programmable Electronic Safety-Related Systems, BS EN ISO/IEC 61508, Part 4, 2010

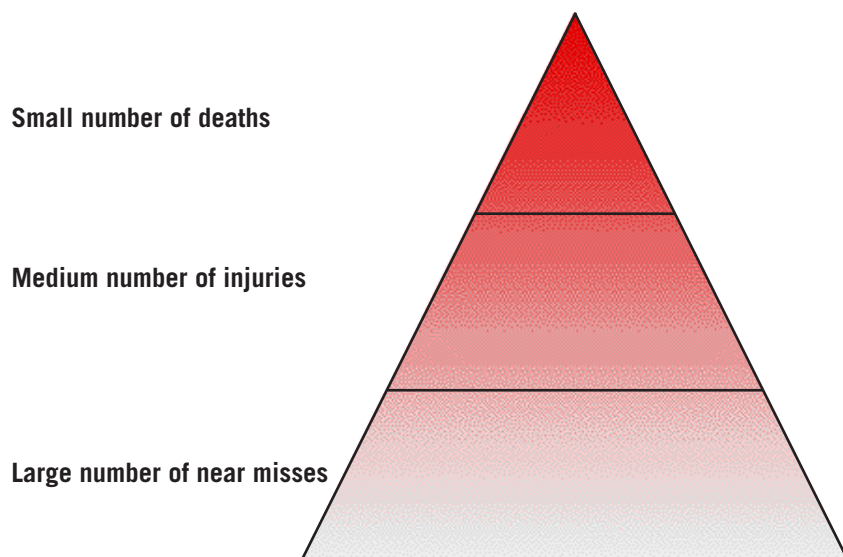
## GENERAL SAFETY TERMS

### A

**ABSOLUTE DUTY:** No defence available against non compliance with statutory requirement

**ACCIDENT:** An incident which results in death, injury loss, or damage.

**ACCIDENT TRIANGLE:** Indicates statistical relationship and severity of accident:



**ACOP:** Approved Code of Practice see below.

**ALARP:** As Low As Reasonably Practicable. (See also SFAIRP). The two terms mean essentially the same thing and at their core is the concept of “reasonably practicable”; this involves weighing a risk against the trouble, time and money needed to control it. Thus, ALARP describes the level to which workplace risk is controlled (HSE).

**ALLERGEN:** An antigen (molecule capable of being recognised by the immune system) that causes an allergic reaction.

**APPOINTED PERSON:** One who is trained in accordance with the appropriate schedule, competent to carry out the duties and appointed in writing.

**APPROVED CODE OF PRACTICE:** A Code of Practice (COP) prepared by management, unions and HSE, that has been approved and accepted by The Health and Safety Commission (HSC).

**AVAILABILITY (g):** Ability [of a system] to be in a state to perform as required. Note: Availability is measured by a probability (a dimensionless quantity between 0 and 1) of the service being provided at an arbitrary time, but is usually expressed as a percentage. Availability is related to reliability (q.v.) but is not the same.

## **C**

**CARCINOGEN:** A substance or physical agent that causes cancer.

**CARCINOGENIC:** Inherent potential of a substance or physical agent to be a carcinogen.

**CDM.** Construction (Design and Management) Regulations.

**CODE OF PRACTICE:** A body of rules for Practical Guidance only and not having the force of law although failure to comply may be used in evidence in legal proceedings.

**COMAH:** Control of Major Accident Hazard Regulations .

**COMMON CAUSE FAILURE (CCF):** a dependent failure (q.v) of two or more (redundant) system elements due to a single cause, for example a fire or flood.

**COMMON MODE FAILURE (CMF):** a dependent failure (q.v) where two or more system elements fail in the same manner, for example by having the same incorrect maintenance action performed on all the elements.

**COMPETENT PERSON:** A practical and reasonable person with sufficient documented training and experience, who knows what to look for, how to recognise it when they see it, and how to deal with it to make it safe. They also know and work within the limits of their competence.

**COSHH (c)** Control of Substances Hazardous to Health.

## **D**

**DANGER (b):** A state or condition in which personal injury and/or asset damage is reasonably foreseeable. The presence of a hazard.

**DEPENDENT (failures):** Failures of two or more elements of a system where these failures cannot be considered independent (q.v). Common cause and common mode failures are dependent failures.

**DERMATITIS:** Inflammation of the skin. When the condition is due to contact with a substance at work it is called ‘occupational’ or ‘industrial’ dermatitis.

**DIVERSITY:** Performing the same function in a redundant system (q.v) by different means in different elements, including different technologies and/or design and implementation methods.

**DUTY Holder:** Any person or organisation holding a legal duty, for example, all employers and persons who provide, use, or control equipment at work as required under PUWER regulations.

## **E**

**EMAS:** Employment Medical Advisory Service.

**ERGONOMICS (a):** The study of the relationship between workers and their occupation, equipment and environment and particularly, the application of anatomical, physiological and psychological knowledge to the problems arising there from, see: <http://www.ergonomics.org.uk/>

ERROR: Mistake; error of judgement leading to action resulting in an accident and its subsequent effects.

ERROR RATE PREDICTION: A forecast of the possibility of error based on statistical data.

ETA: Event Tree Analysis: a graphical method of exploring how an initiating (hazardous) event can lead to an accident via a set of further events. The method allows the exploration of barriers to escalation of the hazard (mitigations) and the calculation of the relative likelihoods of various outcomes.

EWR: Electricity at Work Regulations 1989.

## F

FIRE PRECAUTIONS: The measures taken and the fire protection features provided in a building (e.g. design, systems, equipment and procedures) to minimise the risk to the occupants from the outbreak of fire.

FIRE PREVENTION: The concept of preventing outbreaks of fire, of reducing the risk of fire spreading and of avoiding danger to persons and property from fire.

FIRST AID: The skilled application of accepted principles of treatment on the occurrence of an accident or in the case of sudden illness, using facilities or materials available at the time.

FMEA: Failure Modes and Effects Analysis; a "bottom up" hazard identification technique which considers the individual elements of a system, determines how each element can fail, and explores the effects of each such element failure on the operation of the system as a whole. FMEA can also be used to quantify the failure rate of the total system by counting the contribution of each individual element.

FREQUENCY RATE (e):

$$= \frac{\text{Number of injuries in the period} \times 100,000}{\text{Total hours worked during the period}}$$

FTA: Fault Tree Analysis; a graphical method for analysing how a top event (generally a hazardous event) can be caused by lower level events combined by logical operators (most frequently AND and OR gates). The method is useful for identifying single points of failure or limited redundancy in complex systems, and can be used for system reliability and availability calculations.

FUNCTIONAL SAFETY. Functional Safety is the property of an engineered system of ensuring safety by virtue of the functions which the system performs (which generally fall into two categories: control functions to ensure that a piece of equipment remains in a safe state, and protection functions which put another system into a safe or relative safe state). See also Safety Related System.

## H

HARM: Injury to or death of persons, or damage.

H&S: Health and Safety.

HAZARD (g): A potential source of harm.

HAZARDOUS EVENT: the occurrence of a hazard, generally used in the context of the failure of a safety related system.

HAZAN: Hazard Analysis.

HAZID: Hazard Identification.

HAZOP: Hazard and Operability (study). A systematic method of identifying hazards using a team-based approach and applying a set of standard guide phrases to the elements of a design to determine how these could deviate from the intent of the designers and what the results would be. The method originated in the chemical process industry where it was applied to plant and instrumentation diagrams, but has been adopted more widely and applied to a number of different design descriptions.

HF: Hazards Forum, see: [http://www.hazardsforum.org.uk/content/index.asp?CONTENT\\_ID=1](http://www.hazardsforum.org.uk/content/index.asp?CONTENT_ID=1)

HSC: Health and Safety Commission. A statutory body, established under the Health and Safety at Work etc. Act 1974, responsible for health and safety regulation in Great Britain.

HSE: Health and Safety Executive. A statutory body, established under the Health and Safety at Work etc. Act 1974 (HSWA). It is an enforcing authority working in support of the HSC. Local authorities are also enforcing authorities under HSWA. See: <http://www.hse.gov.uk/>

HSL: Health and Safety Laboratory, see: <http://www.hsl.gov.uk/>

HSPAG: The IET Health and Safety Policy Advisory Group, see: <http://www.theiet.org/policy/panels/health/index.cfm>

HSWA: Health and Safety at Work Act 1974.

## I

IIDB: Industrial Injuries Disablement Benefit statistics.

INDEPENDENT (failure): The situation where the probability of two or more system elements failing simultaneously is the product of the failure probabilities of the individual elements.

IMPROVEMENT NOTICE: One of a range of means which enforcing authorities use to achieve the broad aim of dealing with serious risks, securing compliance with health and safety law and preventing harm. It allows time for compliance.

INCIDENCE RATE (c):

$$= \frac{\text{Total number of accidents} \times 1000}{\text{Number of persons employed during the period}}$$

INCIDENT: An unplanned, unexpected event which has the potential to lead to an accident although may not do so.

ISA: Independent Safety Assessor (or Auditor, depending of the industry context and scope of work).

## J

JIGSR: Joint Inter-Institutional Group on Safety and Risk.

## L

LFS: Labour Force Survey.

LOCK OFF: A system whereby controls such as switches or valves can be physically and intrinsically locked in the 'OFF' position as part of a SAFE SYSTEM of work.

LOLER: Lifting Operations and Lifting Equipment Regulations.

LOSS: Personal injury and/or asset damage.

## M

MAINTAINABILITY (g): Ability to be retained in, or restored to a state to perform as required, under given conditions of use and maintenance. Note 1 (g): Given conditions would include aspects that affect maintainability, such as: location for maintenance, accessibility, maintenance procedures and maintenance resources. Note 2: MTTR is a commonly used measure of maintainability. For related definitions see reference (g).

MANUAL HANDLING: Any means of transporting or supporting a load manually. Lifting, putting down, pushing, pulling, carrying or moving by hand or bodily force.

MEAN DURATION RATE (c):

$$= \frac{\text{Total number of days lost}}{\text{Total number of accidents during the period}}$$

MEANS OF ESCAPE (f): Structural means whereby a safe route is provided for persons to travel unaided from any point in a building to a place of safety.

MISTAKE: A human action that produces an unintended result.

MITIGATION: factors or events which can prevent a hazard escalating to an accident, or can reduce the likelihood or severity of an accident. Mitigation can be provided by a number of means including engineered systems, procedures and providence - "good luck".

MSD: Musculoskeletal Disorders.

MTBF: Mean Time Between Failures.

MTTF: Mean Time to Failure.

MTTR: Mean Time to Restore (or Repair).

## **N**

NARCOTIC: Agent that depresses brain functions e.g. organic solvents.

NEAR MISS: An incident, which did not show a visible result, but had the potential to do so.

NEGLIGENCE: The omission to do something, which a reasonable person, guided upon those considerations which ordinarily regulate the conduct of human affairs would do, or something, which a prudent and reasonable person would not do.

NHS: National Health Service.

## **O**

OH: Occupational Health.

OHS: Occupational Health and Safety.

ONS: Office of National Statistics.

## **P**

PAT: Portable Appliance Testing.

PCBs: Polychlorinated Biphenyls.

PERMIT TO WORK: A formal written or verbal authority to operate a planned procedure, which is designed to protect personnel, working in hazardous areas or activities, or when performing maintenance on a safety-related system. Authority for a safe system of work.

PFD: Probability of Failure on Demand (applied generally to a plant protection system).

PLC: Programmable Logic Controller: a computer based system which is programmed by special purpose languages intended for use by application domain engineers rather than software specialists.

POLICY: A statement of corporate intent, which will be adopted and pursued as advantageous or expedient.

PPE: Personal Protective Equipment e.g. respirators, protective gloves, protective clothing, protective footwear, eye protection.

PRACTICABLE (c): Technical feasibility without reference to costs.

PUWER: Provision and Use of Work Equipment Regulations.

## **Q**

QUALIFIED WORKER (a): One who is accepted as having the necessary physical attributes, who possesses the required intelligence, training and education, and has acquired the necessary skill and knowledge to carry out the work in hand to satisfactory standards of safety, quantity and quality.

QUANTIFIED RISK ASSESSMENT (QRA): A risk assessment where the frequency of a hazardous event is stated in quantitative terms, expressed in units such as one major accident per 1000 years, or fatalities per year. Fault Tree Analysis (FTA) and Event Tree Analysis (ETA) are among the techniques used in QRA.

## **R**

RBI: Risk Based Inspection.

REDUNDANCY. Having more than one system element able to perform a given function, a design method which can greatly increase the reliability and availability of a system.

REACH. Registration, Evaluation, Authorisation and Restriction of Chemicals regulation. The regulation gives greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances.

RELIABILITY (g): The ability [of a system] to perform as required, without failure, for a given time interval, under given conditions.

- Note 1: The time interval duration may be expressed in units appropriate to the item concerned, e.g. calendar time, operating cycles, distance run, etc., and the units should always be clearly stated.
- Note 2: Reliability can be measured by figures such as the Mean Time to Failure (MTTF) or failure rate (number of failures per unit time) – for related definitions see reference (g).
- Note 3: Sometimes confused with Availability (q.v.).

REASONABLY PRACTICABLE (c): A computation made in which the quantum of risk is placed on one scale, and the disadvantages involved in the measure necessary for averting the risk is placed upon the other. A balance between: risk and cost, inconvenience, effect on production.

RIDDOR (c): Reporting of Injuries Diseases and Dangerous Occurrences Regulations.

RISK (g): Combination of the probability of occurrence of harm and the severity of that harm.

RISK ASSESSMENT: A process where hazards are identified and risks evaluated, with the objective of eliminating or reducing the risks to an acceptable level, in the UK this generally means reducing risk to a level which is tolerable and as low as reasonably practicable (ALARP).

## S

SAFE SYSTEM OF WORK: A method of working that eliminates or reduces the risk of injury.

SAFETY: Freedom from (unacceptable) risk of harm to persons. Safety may also encompass environmental or asset damage/loss.

SAFETY AUDIT: Monitoring of the implementation of a safety policy by subjecting each area of an activity to a systematic critical examination with the purpose of minimising loss, and providing a quantified assessment of performance.

SAFETY CASE: A structured presentation consisting of arguments and supporting evidence which shows that a system or operation is safe, by consideration of the hazards inherent in the system and the means by which they are managed so that the resulting risk is acceptable (for example, tolerable and ALARP). Most commonly used in high potential risk situations e.g. the petro-chemical industry, nuclear Installations, air traffic control systems and operations, military systems.

SAFETY COMMITTEE: A committee representative of all staff with the objective of promoting co-operation in investigating, developing and carrying out measures to ensure the health, safety and welfare of the employees.

SAFETY CULTURE: This term has no widely agreed definition. It may be described as a product of the individual and group values, attitudes, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of an organisations health and safety programmes.

SAFETY INSPECTION: Systematic assessment of safety standards for plant, place of work, working. Carried out by a manager and not a safety adviser/engineer.

SAFETY INTEGRITY LEVEL (SIL) (h): A measure of safety system performance, in terms of reliability or probability of failure on demand. There are four safety levels SIL 1-4. The higher the SIL level (SIL 4 highest), the higher the associated safety level and the lower the probability that a system will fail to perform properly.

SAFETY MANAGEMENT SYSTEM (SMS): Management of Safety in order to promote a strong Safety Culture and achieve high standards of safety performance.

SAFETY MONITORING: Periodic checks on observance of corporate safety standards and procedures.

SAFETY POLICY: A legal requirement on an employer to prepare, and keep up to date a written statement of their policy regarding the health and safety of their employees. The requirement for a written statement is for 5 or more employees.

SAFETY REPRESENTATIVE: A person appointed by a recognised trade union, who is recognised by the employer under the Safety Representatives and Safety Committees Regulations 1977 and who fulfils the function conferred upon them by the Regulations.

SAFETY SAMPLING: Systematic sampling of particular dangerous activities, processes or areas.

SAFETY SURVEYS: General inspections of the particular dangerous activities, processes or areas.

SAFETY TOURS: General Health and Safety inspections.

SEVERITY: of a hazard, the degree of harm which a hazard can create if it occurs; the measure of severity depends on the industry sector.

SEVERITY RATE (c):  
= 
$$\frac{\text{Total number of days lost} \times 1000}{\text{Total number of man hours worked}}$$

SFAIRP. So Far As Is Reasonably Practicable (see ALARP).

SIS: Safety Instrumented System – a term used in the chemical and related process sector to denote a protection system which intervenes to put a plant in a safe state if measurements of plant parameters indicate that this is required.

SHE: Safety, Health and Environment.

SWORD: Surveillance of Work Related & Occupational Respiratory Diseases.

## **T**

THOR: The Health and Occupational Report network (also, in functional safety, Tolerable Hazard Occurrence Rate)

ToR: Tolerance of Risk.

TOXIC: Inherent potential of a substance to cause harm.

TOXIN: Substance that causes harm.

## **W**

WORKPLACE: The workplace may be described as any place where people are at work.

WEEE. The Waste Electrical and Electronic Equipment directive aims to minimise the impact of electrical and electronic goods on the environment, by increasing re-use and recycling and reducing the amount of WEEE going to landfill.

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