International Diploma

DI1: Know – workplace health and safety principles (International)

SAMPLE RESOURCES

This RMS sample resources pack contains a selection of PowerPoint slides together with a supporting lesson plan and are representative of the full set of RMS trainer materials for the NEBOSH International Diploma Unit ID1 qualification.

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Element 5
Monitoring, review and auditing

5

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Learning outcome

- You will be able to develop and implement proactive and reactive health and safety monitoring systems and carry out reviews and auditing of such systems

Assessment criteria

On completion of this element, learners should be able to:

5.1 Explain different types of loss causation theories/models, tools and techniques and how loss data can be analysed

5.2 Outline the purpose and use of health and safety performance measurement, monitoring and review

Contents

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Contents

Theories/models and use of loss causation techniques

- Loss causation theories/models, tools and techniques
- The quantitative analysis of accidents and ill-health data

Loss causation theories/models, tools and techniques

- Understand some of the underlying principles connecting causes and outcomes
- Causation theories/models, tools and techniques

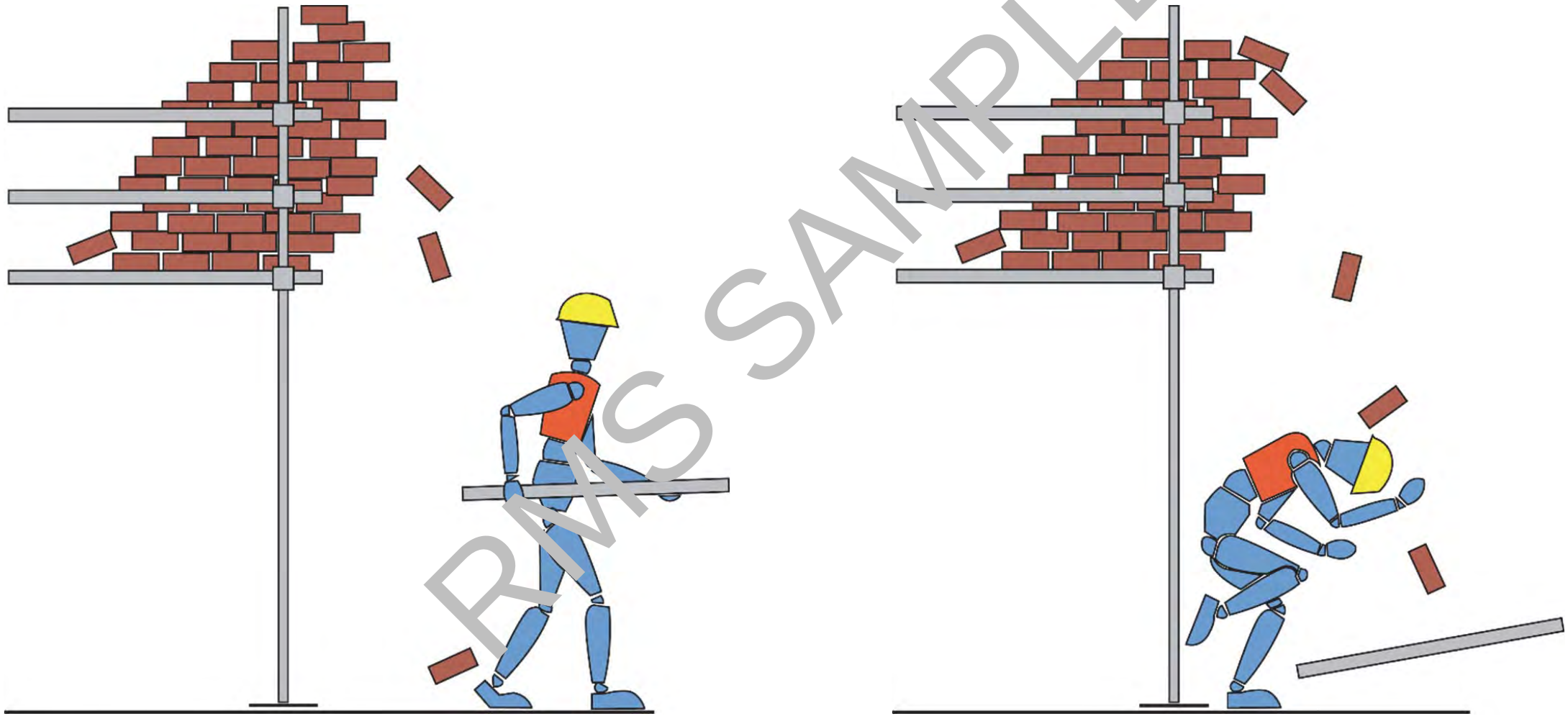
Understand some of the underlying principles connecting causes and outcomes

- Incidents with the same cause(s) usually have a range of possible outcomes
- Use of incident ratio data studies

Incidents with the same cause(s) usually have a range of possible outcomes

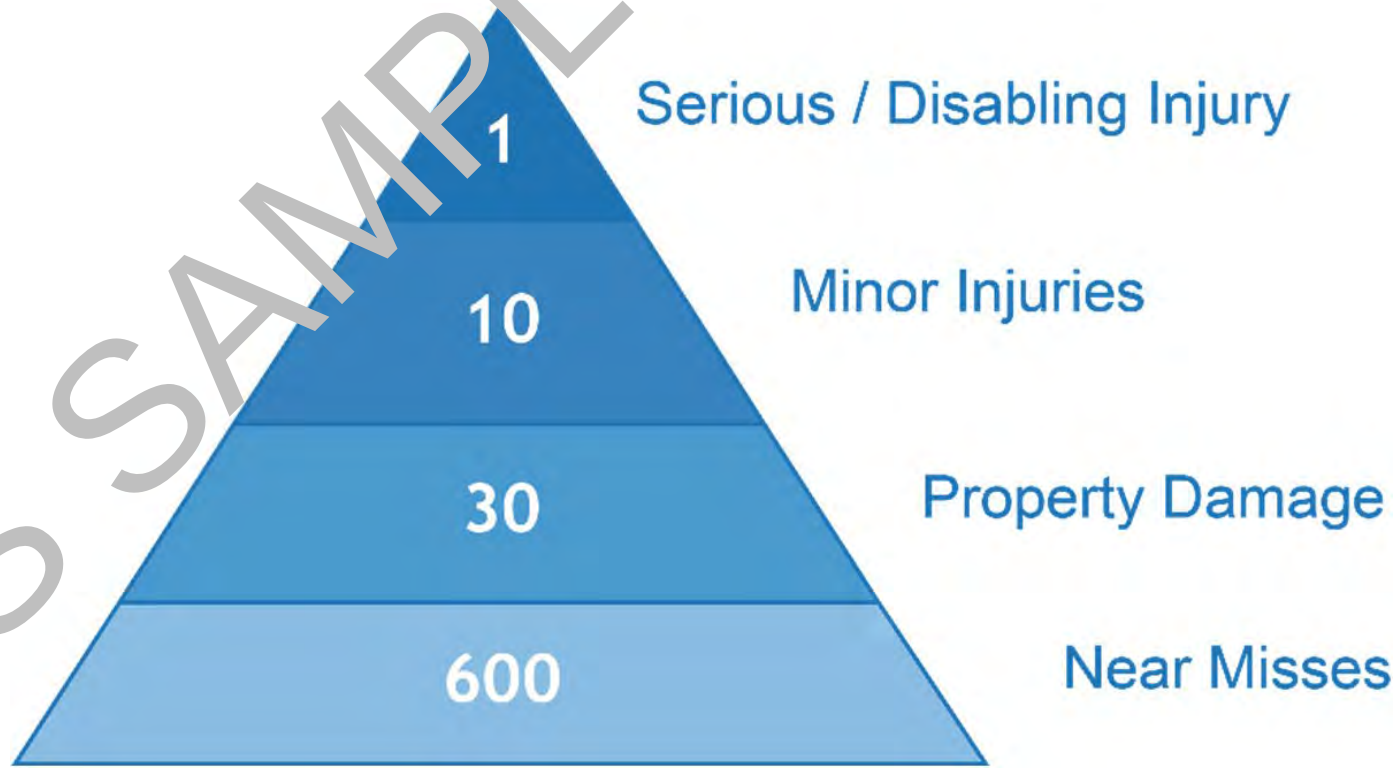
- Incidents with the same cause(s) can have a number of possible outcomes, depending on the actual circumstances at the time of the incident
- The outcomes could range from a near miss, with no harm to people, through to minor and serious injuries or possibly death

Incidents with the same cause(s) usually have a range of possible outcomes



Use of incident ratio data studies

- Advantages of incident ratio triangles
- Limitations of incident ratio triangles



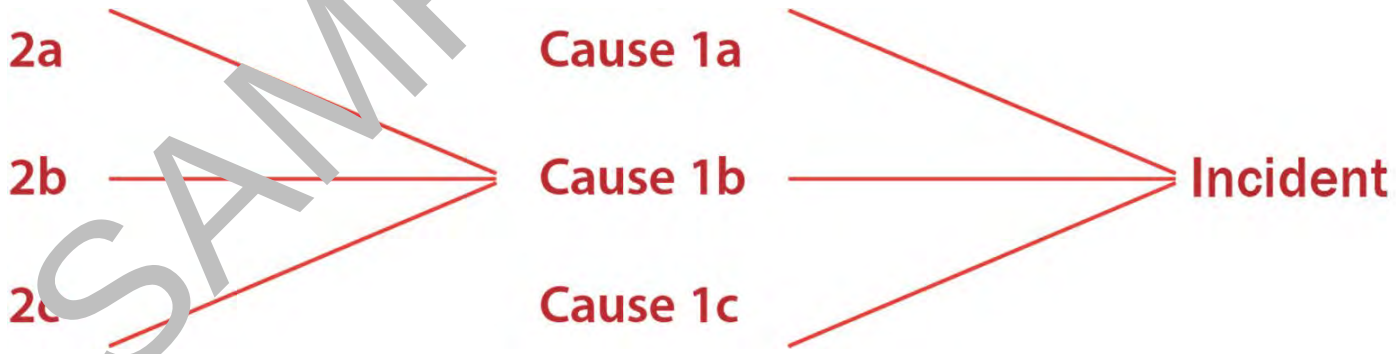
Causation theories/models, tools and techniques

- Multi-causality theory
- Latent and active failures - Reason's model of incident causation (Swiss Cheese Model)
- The principles and application of root cause analysis tools
  - 5-Whys
  - Fishbone diagram
- Fault tree
- Event tree
- Bowtie model

Causation theories/models, tools and techniques

Multi-causality theory

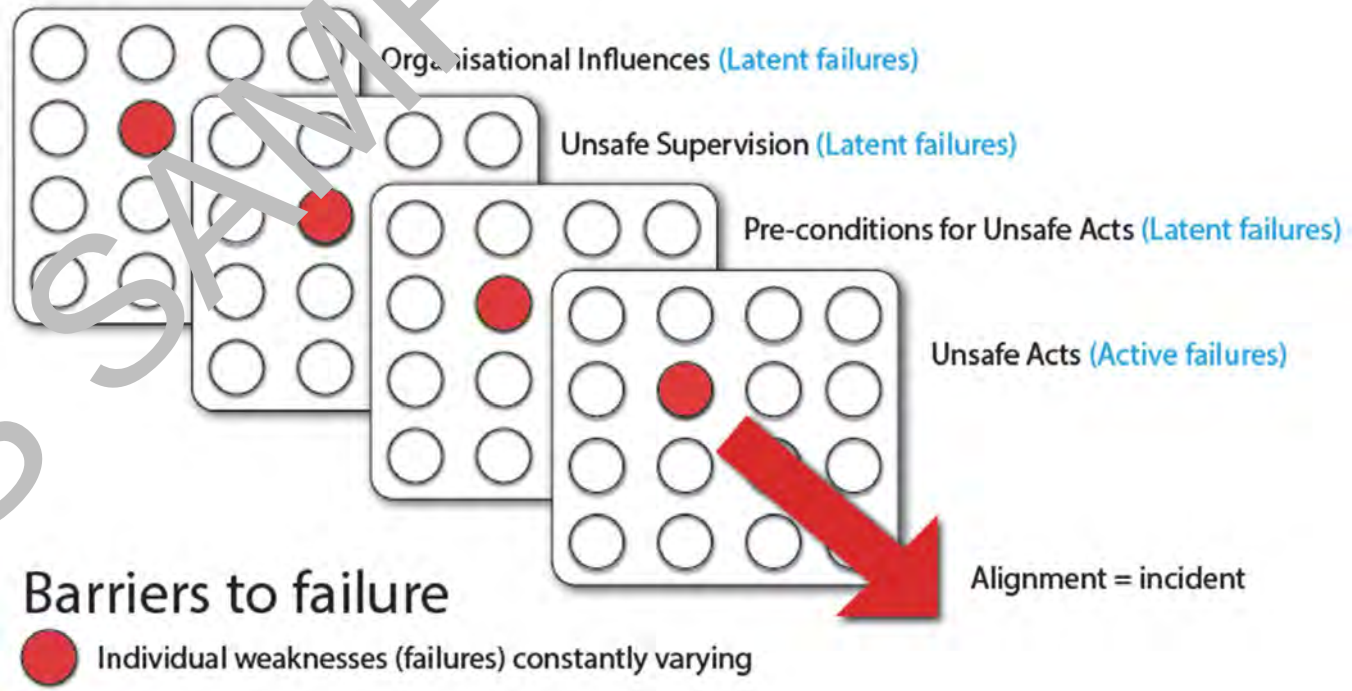
- 'Immediate (direct) causes'
- Underlying (indirect) causes
- Root causes ('lack of management control')



Causation theories/models, tools and techniques

Latent and active failures - Reason's model of incident causation (Swiss Cheese Model)

- In his causation model Reason proposed four levels of human failure, each influencing the next



The principles and application of root cause analysis tools

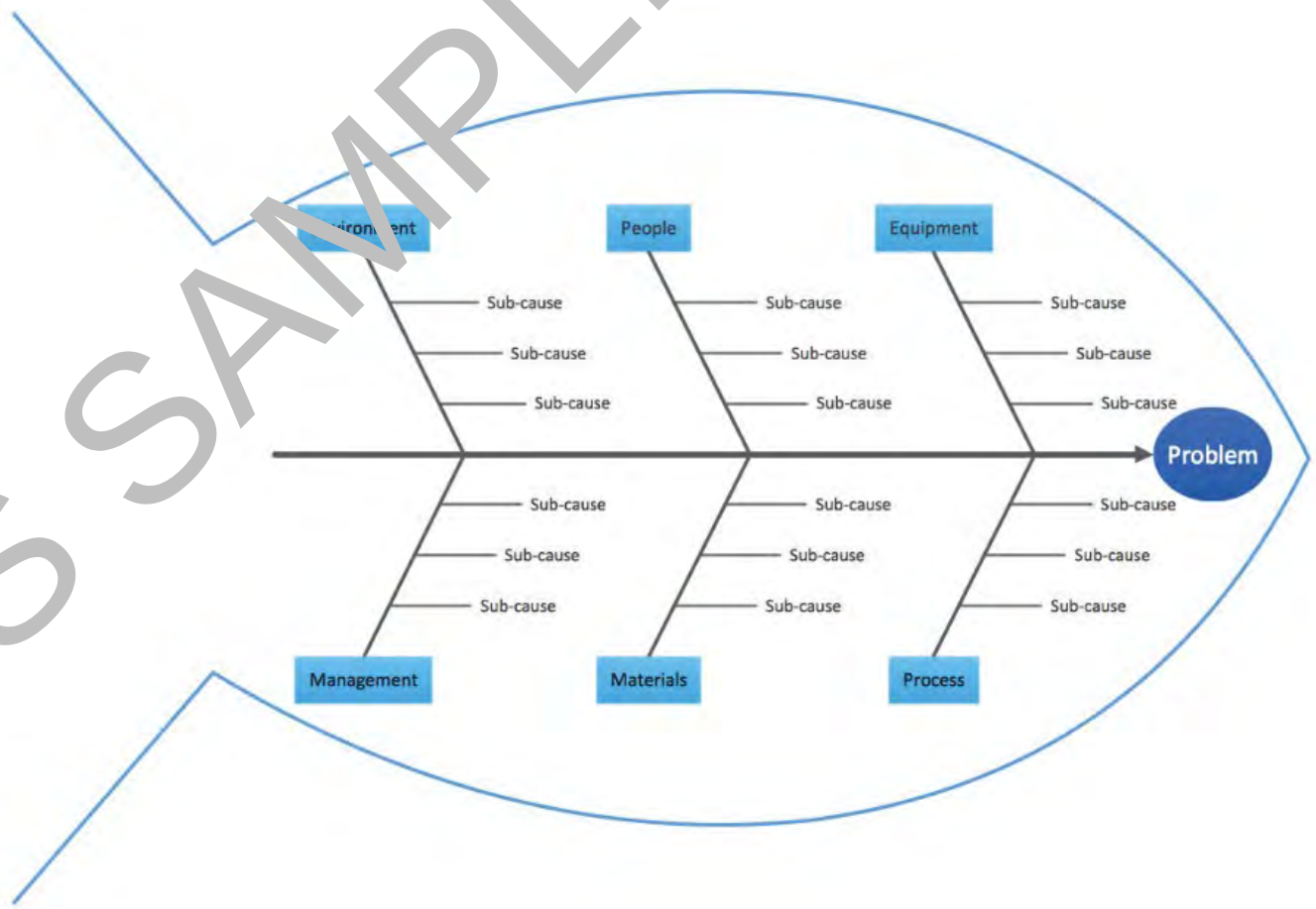
5-Whys

- A causal analysis technique that helps to determine the root cause of an incident
- The 5 Whys technique involves looking at an incident and asking: "Why?"
- The answer to the first "why" will usually prompt another "why" and the answer to the second "why" will prompt another and so on

The principles and application of root cause analysis tools

Fishbone diagram

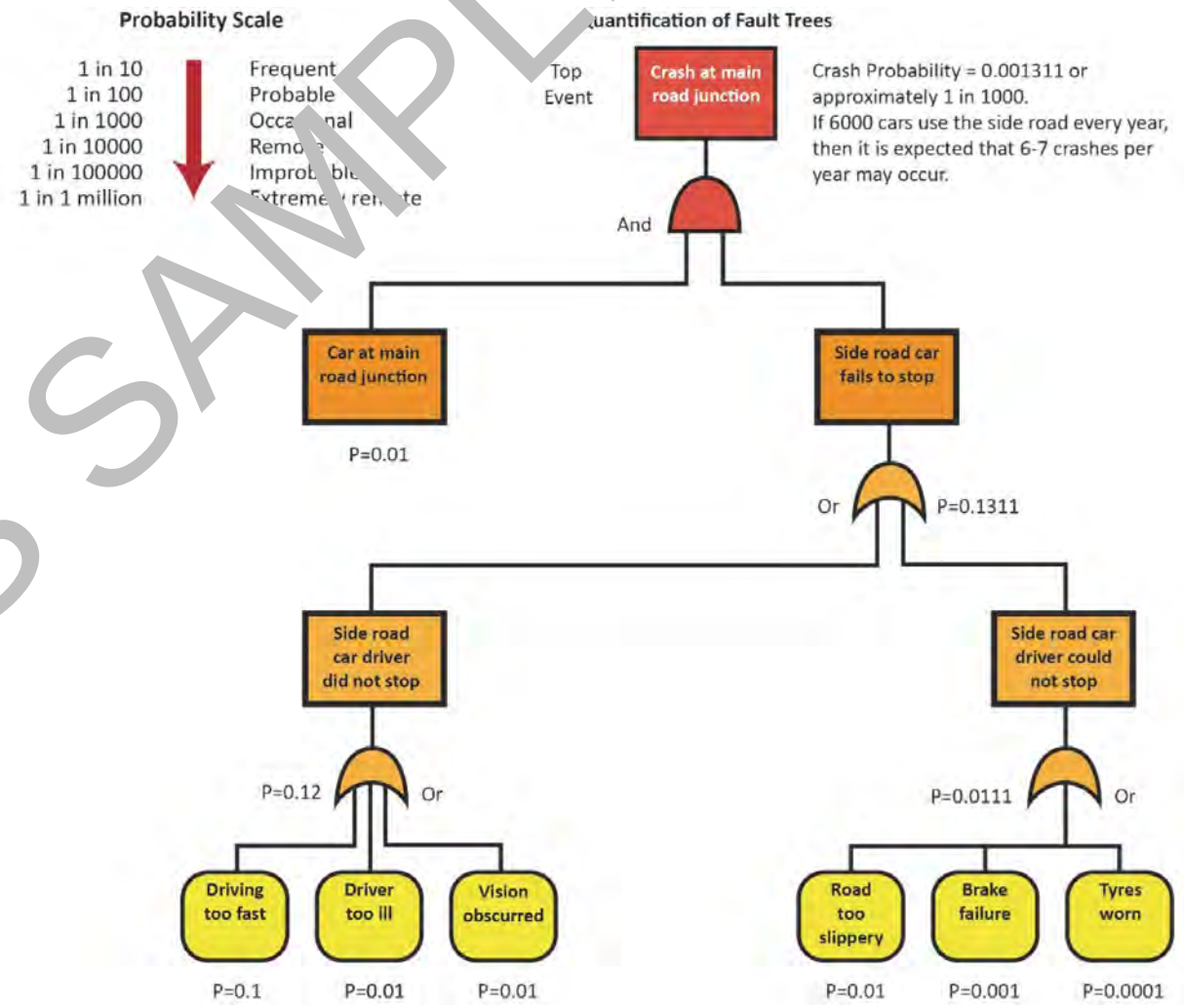
- An analysis tool that provides a systematic way of looking at effects and the causes that create or contribute to those effects
- A visual way of looking at cause and effect and is sometimes called a cause-and-effect diagram



The principles and application of root cause analysis tools

Fault tree

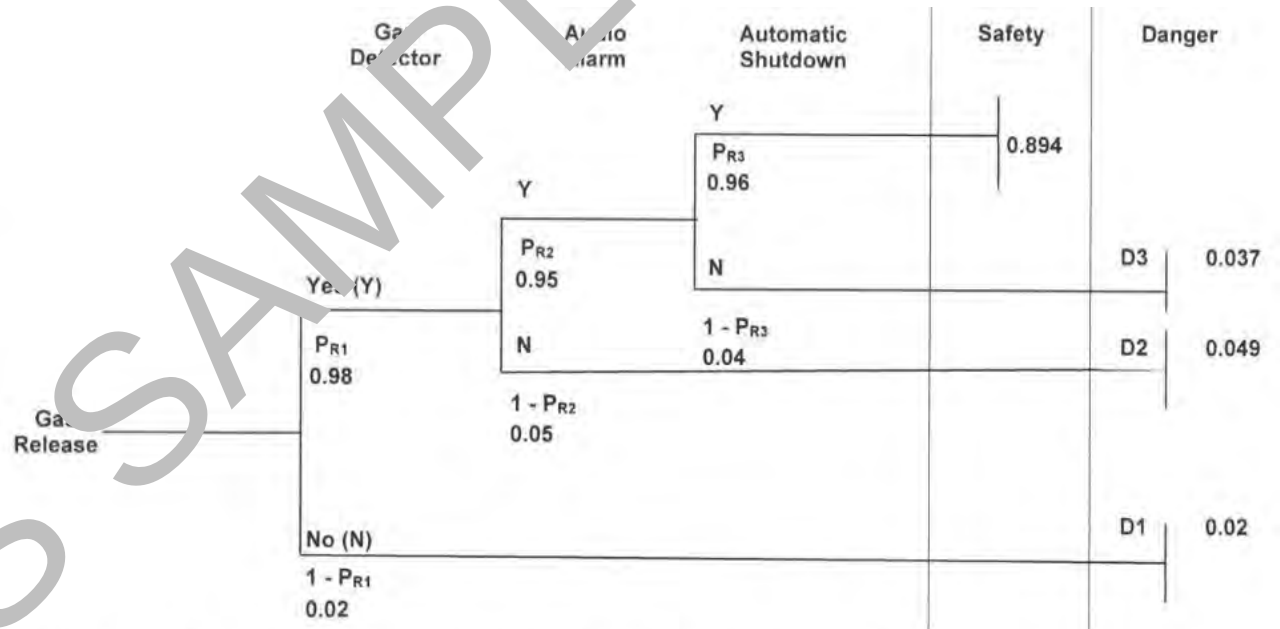
- A logic-based causal analysis process used to identify and analyse the 'faults' (causes) which led to an incident
- Describes the sequences of faults, by working downwards from the incident
- Constructed by using logic symbols ('or' gates and 'and' gates)



The principles and application of root cause analysis tools

Event tree

- Is a 'forward thinking' process
- Provides a methodical way of recording the event sequences and defining the relationships between the initiating event and the subsequent events that combine to result in an incident



Calculating the probability that the plant will be shut down if there is a release of gas.

Probability of failure (danger):

D1 + D2 + D3 = danger

0.02 + 0.049 + 0.037 = 0.106 = danger

Probability of success (safety):

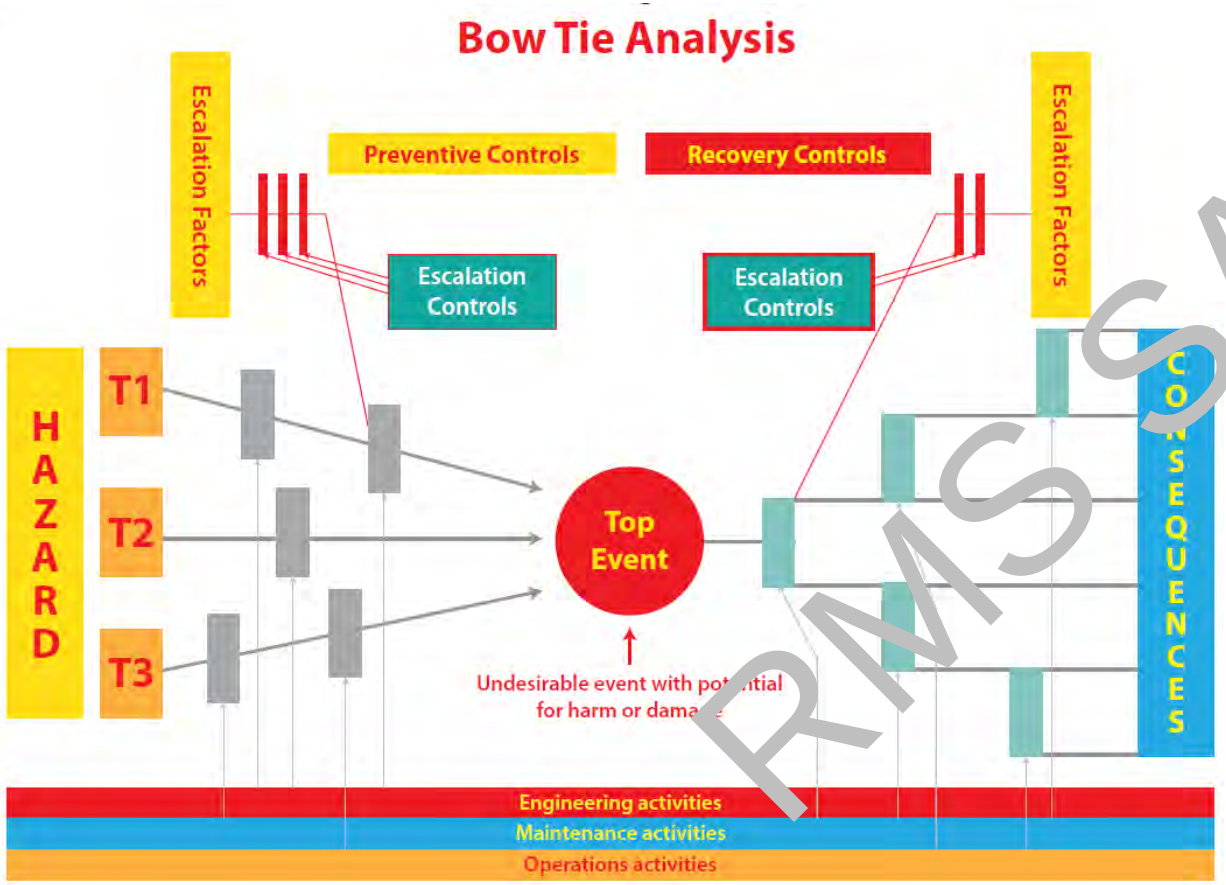
$P_{R1} \times P_{R2} \times P_{R3}$ = safety

0.98 x 0.95 x 0.96 = 0.894 = safety (plant shut down in event of gas release)

A check will show that adding the probability of danger to that of safety will give 1. (0.894 + 0.106 = 1).

The principles and application of root cause analysis tools

Bowtie model



- Provides a visualisation of the relationships between the causes of incidents and their consequences
- Easy for the non-specialist to understand
- Combines feature of types of analysis, analysis of the causes (fault tree) and analysis of the consequences (event tree)

The quantitative analysis of accidents and ill-health data

- The impacts that statistics can have on an organisation and organisational reputation
- Methods of calculating loss rates from raw data
- The limitations of accident and ill-health data

Methods of calculating loss rates from raw data

- Accident frequency rate
- Accident incidence rate
- Accident severity rate
- Ill-health prevalence rate

The limitations of accident and ill-health data

- Reactive measurements
- Errors in data due to under-reporting
- Comparability
- Statistically representative
- Link between outcomes and risks
- Number versus severity
- Motives for reporting and absence
- Conclusions drawn

NEBOSH International Diploma – Unit DI1 – Know – workplace health and safety principles

(UK) Lesson Plan – Day 1

TIME	REF /TOPIC	ASSESSMENT CRITERIA / CONTENT	RESOURCE/TASK
08.45	Welcome		Computer with USB/DVD/Sound functionality. Flip charts, examiners reports, internet access.
	Introduction	Name, job, background, experience The lesson plan has been designed to be flexible – timings are only approximations that the tutor can flex – depending on the capability of the group being tutored. The delivery sequence may not necessarily follow that of the syllabus. Activities are suggested and should be varied or adapted depending on the group experience/knowledge and available time. Reference to suitable videos, props, objects from real life used in classroom instruction and other media is made, these are suggestions only and the tutor can introduce different material as they feel appropriate.	Name cards Ice breaker. Split the group into teams of three or four. Team members to interview each other and find out hobbies/ likes/dislikes etc. and represent these pictorially. Team to give themselves a name and introduce their team to the wider group.
	Course plan	Admin arrangements Course content Syllabus and assessment arrangement The course will require learners to undertake some research.	Complete paperwork if necessary
	Programme for the study period	Topics to be covered	Slides, NEBOSH Syllabus guide www.nebosh.org.uk (learner downloads section) also resources https://www.nebosh.org.uk/digital-assessments/diploma-assessments/ Small Group exercises: as sections of the material are covered and as time permits, divide group into small groups of 2 or 3 – set selected study questions, as confirmation of understanding, relevant to topics being discussed. Outline answers only required – collect whole group feedback using flipchart as focus.
		Learning outcome 1 You will be able to advise on the types of legislation likely to apply to your organisation and how enforcement actions could apply; the relevance of	Slides/Flipchart Tutor asking questions to whole group and/or specific

TIME	REF /TOPIC	ASSESSMENT CRITERIA / CONTENT	RESOURCE/TASK
		the International Labour Organization's conventions/recommendations to the organisation; how non-government bodies and standards could influence health and safety in the organisation.	individuals to establish learning. **Tutor references:** Insurance and health and safety, Association of British Insurers http://www.abi.org.uk/products-and-issues/choosing-the-right-insurance/business-insurance/liability-insurance/employers-liability-insurance/workplace-health-and-safety/ Building a preventative safety and health culture. A guide to the Occupational Safety and Health Convention, 1981 (No. 155), its 2002 Protocol and the Promotional Framework of Occupational Safety and Health Convention, 2006 (No. 187), ILO https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---normes/documents/publication/wcms_233211.pdf Controlling the risks in the workplace, http://www.hse.gov.uk/risk/controlling-risks.htm Encyclopaedia of Occupational Health and Safety, ILO, http://www.iloencyclopaedia.org/preface-69563 Enforcement Management Model (EMM), HSE, http://www.hse.gov.uk/foi/internalops/ocs/100-199/130_5/ Enforcement Policy Statement, HSE41, http://www.hse.gov.uk/enforce/enforcepolicy.htm Guidance on permit-to-work systems. A guide for the petroleum, chemical and allied industries, HSG250, HSE Books, ISBN: 978-0-7176-2943-5, http://www.hse.gov.uk/pubns/books/hsg250.htm Hersey-Blanchard Situational Leadership Theory, http://www.leadership-central.com/situational-leadershiptheory.html#axzz3p0SLB4U1 Just culture: who gets to draw the line? Sidney W A Dekker

TIME	REF /TOPIC	ASSESSMENT CRITERIA / CONTENT	RESOURCE/TASK
			https://www.humanfactors.lth.se/fileadmin/lusa/Sidney_Dekker_article_2008/JustCultureCTW.pdf Occupational Health Services Convention C161, 1985, ILO, http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C161 Occupational Safety and Health Convention, C155, 1981, ILO, http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C155 Occupational Safety and Health Recommendation, R164, 1981, ILO, http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312502:NO Promotional Framework for Occupational Safety and Health Convention, C187, 2006, ILO, http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C187 Promotional Framework for Occupational Safety and Health Recommendation R197, 2006, ILO, http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:R197 Risk assessment, A brief guide to controlling risks in the workplace, INDG163, HSE Books, http://www.hse.gov.uk/pubns/indg163.htm Training Package on workplace risk assessment and management for small and medium-sized enterprises, ILO Guidance, ISBN: 978-92-2-127065-2, http://www.ilo.org/safework/info/instr/WCMS_215344/lang--en/index.htm The United Nations website https://www.un.org/en/about-us/
09.15	**1.1: Socio-legal models**	**Assessment criteria:** Outline how legislation can promote positive health and safety outcomes, 'goalsetting' and 'prescriptive' legislation and possible compensatory mechanisms for loss event where there is a failure	Slides/Flipchart