



Safety in Design Fabrication & Construction of Workplace



Why safety in Design – a case study

In UK 91 randomly selected incidences were analysed to see if design has contributed to these incidences in any way:

- ❑ In 25% of incidences the actual operating conditions were not considered.
- ❑ In 17% of incidences designers had not done enough to built the risk mitigation measures into the design.
- ❑ In 10% of incidences the designers did not provide adequate information to the users and operators



Understanding safety in Design

Safety in design may be defined as

“The interaction of hazard identification and risk assessment methods early in the design process to eliminate or minimize the risk of injury throughout the life cycle of the entity being designed. It encompasses all facets of workplace design including facilities, hardware, systems, Equipments, product, tooling, materials, energy controls, layout and configuration”



Inputs for safety in Design

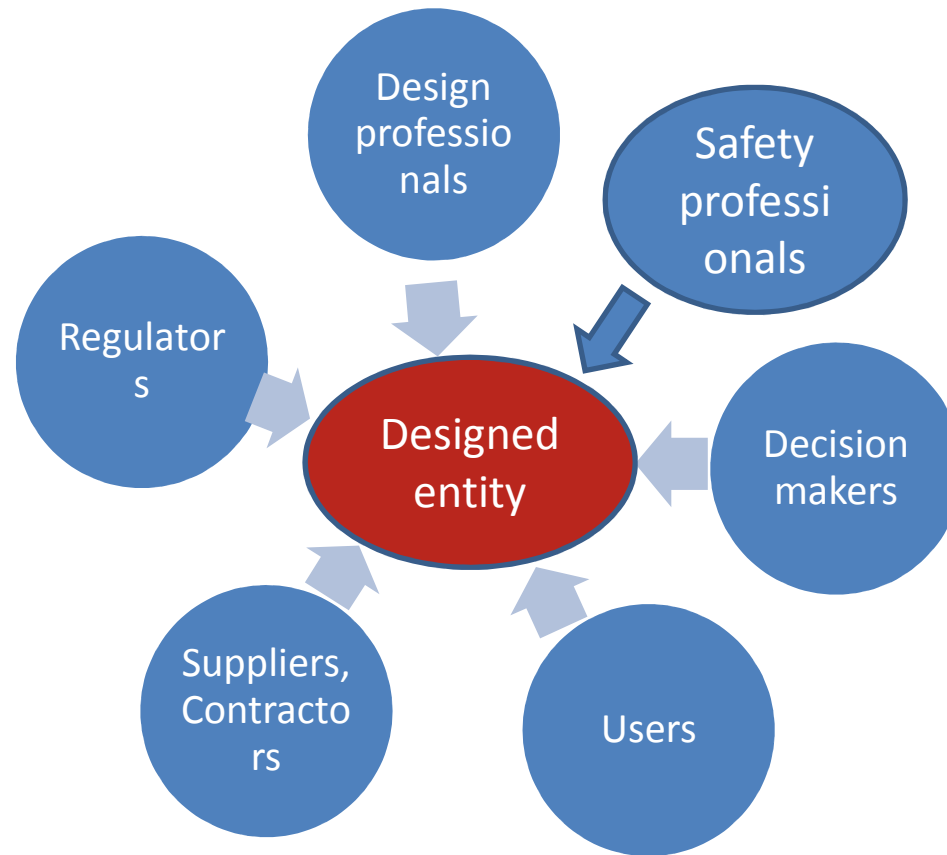
1. Design objectives and the expectations
2. Legislative requirements
3. Relevant standards and the code of practices
4. Actual operating conditions
5. Hazard and risk during the entire life cycle of the entity being designed.
6. Capacity to tolerate risk and the cost involved.



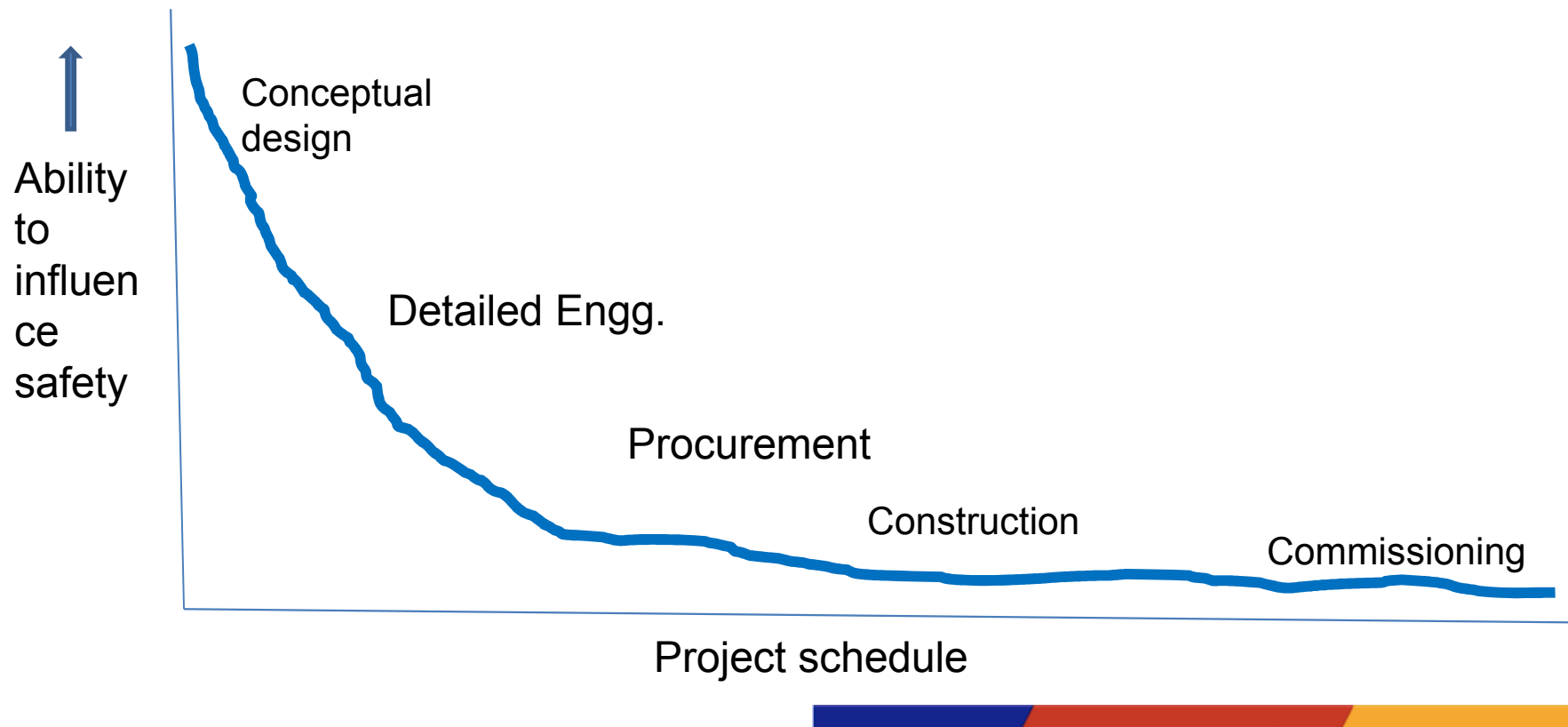
Who influences safety in design

1. Decision makers, Managers
2. Design professionals, Engineers
3. Safety Professionals
4. Persons who use or work on the entity or are affected by it
5. Suppliers, Contractors
6. Government regulators, inspectorate





How to get the most of safety in Design



Principles of introducing safety in Design

1. Promote health and safety by working at the source. This can be done by persons making decisions affecting the design of the entity.
2. Safe design applies to every stage in the lifecycle of the entity from conception through to demolition. It involves eliminating hazards or minimising risks as early in the lifecycle as possible.
3. Application of HIRA for potential hazards visualized at the design stage of the entity.
4. Safe Design Knowledge and Capability should be either demonstrated or acquired by persons with control over design and should reflect the knowledge that a competent designer would be expected to have.



Principles of introducing safety in Design

5. Effective communication channel should be established for communicating design and risk control information between all the stakeholders through out the life cycle of the entity.



Steps to ensure safety in Design

1. Establish the context
2. Identify foreseeable uses of the entity
3. Identify design requirements including legislative requirements
4. Carry out hazard identification and risk assessment of potential hazards during actual and foreseeable uses of the entity.
5. Use available design alternatives to minimise risk and wherever possible provide built in controls.
6. Manage residual risk and communicate to the users and others who are likely to be affected by the entity.
7. Monitor and review the design process at all stages of design including control of changes if any.



Benefits of safety in design

1. Better understanding of design requirements and limitations
2. Minimization in the possibility of injury and disease
3. Improvement in usability and operability
4. Reduced costs
5. Better prediction and management of process results
6. Compliance with legalisation



Managing safety and health at metal scaffolding work

Managing safety and health at metal scaffolding work

1. Design and initial planning
2. Selection of subcontractor for metal scaffolding work
3. Site management during construction
4. Safe working practices on scaffolding
5. Monitoring safety performance

Design and initial planning

- Strength and stability of the scaffold and a realistic assessment of loading
- Provision of safe access and egress
- Provision of necessary features like attachment points for ladders, working platforms, guard rails and toe boards
- Site consideration and assessment of associated risks such as existence of overhead power lines, any physical projections, buried services, storage tanks, restricted access etc.
- Firm up the boundary conditions and document all necessary requirements.

Selection of subcontractor for metal scaffolding work

- ❑ Depending on the complexity of the project the contractor should have a suitable safety organization, trained manpower, equipments, facilities, emergency procedures etc.
- ❑ The contractor should be able to develop the necessary scaffolding plan and a method statement that meet the stipulated requirements.

Site management during construction

- ❑ Use the scaffolding plan and method statement for supervision and monitoring of scaffolding work

- ❑ Throughout the execution of contract ensure total co-ordination both on site and offsite. Any change in design, layout or procedure should be discussed and agreed before implementation.

- ❑ Contingency plan for adverse weather or other unforeseen conditions should be prepared and be in readiness.

Safe working practices on scaffolding

- Carry out scaffolding inspection before use to ensure the same is safe for working
- Guard rails and toe boards shall be installed at edges where there is a likelihood of people to fall
- Safety belts, Full body harness or safety nets shall be used as per necessity
- Concerned workers must undergo training for working at height and other related issues.

Monitoring safety performance

- Periodic inspection and recording. Close monitoring of safety conditions, including hazard reporting, incidence analysis and recommendations
- Workers feedback on safety conditions at site needs to be encouraged and considered with all seriousness.

Conclusion