Construction OS&H

Processes and systems

Summary

Brief review of systems theory and practice: ‘Systems theory at a glance’
ILO-OSH 2001: Guidelines on occupational safety & health management systems
Hazards and risks
Assessment and management of hazards and risks
The systematic **Construction OS&H** process
Communication systems to improve OS&H

What is a ‘system’?

We all use the word ‘system’ in everyday conversations. Spend a few moments thinking about what it means and suggest a few key factors that make a system.

‘Systems theory at a glance’

A broad and comprehensive view of a managerial problem, initiative or process. Individual elements should not be considered in isolation, but within a framework that takes into account the interactions with other parts of the ‘system’. This concept is especially important to OS&H in the construction industry, where construction projects are complex and involve a wide range of organisations and individuals. Lack of care in an apparently minor detail can have catastrophic and widespread effects.

A ‘system’ comprises elements and linkages. In the case of OS&H, the ‘elements’ include written policies, risk assessments, method statements and communication strategies, which are linked by an agreed set of processes and procedures.

‘Systems theory at a glance’

The ‘system’ is ‘goal-oriented’: that is, it is directed to achieve specific and usually quantified objectives. Methods, processes and procedures are formulated to achieve the desired objectives; the focus is on ends not means. This implies that there may be a number of different ways in which the desired goals can be achieved, and that it is important to examine these alternatives carefully so as to take the most effective decisions and actions.

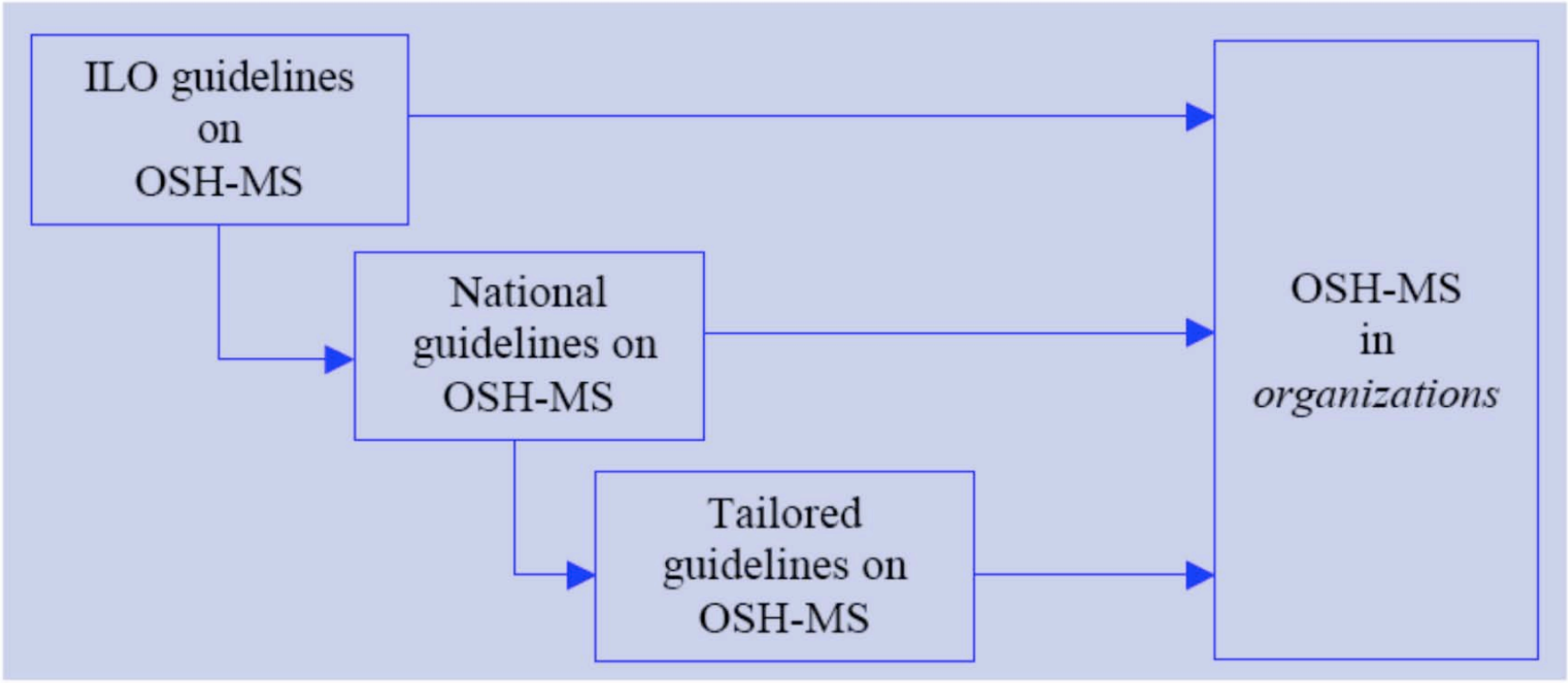
There is an element of what would now be called ‘learning’ within the system; that is, provision for review and feedback is built in to the processes and procedures. The system is, therefore, ‘dynamic’ and continually developing and improving.

ILO-OSH 2001:
Guidelines on occupational safety & health management systems

"These guidelines should contribute to the protection of workers from hazards and to the elimination of work-related injuries, ill-health, diseases, incidents and deaths".

The Guidelines provide a comprehensive set of recommendations for effective OS&H systems.

Progressive implementation at national level and then in organisations



A progressive and continual process of:

- Developing OS&H policy
- Organising to implement the policy
- Planning and taking OS&H actions
- Monitoring and evaluating the results
- Taking further action for continual improvement

Policy

All the organisations involved in a construction project should have a written and agreed OS&H policy. The policy should be:

- Written specifically by and for the organisation
- Formulated with the participation of employees and their representatives
- Adopted positively at all levels, especially by senior management
- Be clearly stated and effectively communicated to all
- Continually reviewed and up-dated

Policy

The policy should include the following:

- A strong commitment to protecting the safety and health of all members of the organisation
- A statement of compliance with all relevant laws, regulations and agreements
- A management structure of organisation and responsibility
- Comprehensive consultation processes and procedures
- Comprehensive review, audit and feedback processes, and a firm commitment to continual improvement
- Compatibility with other management systems or embedded in them

Organising

Ensure that the effective management of OS&H is an accepted part of the job of all managers and supervisors.

Engage the workers in positive and effective participation processes.

Establish clear, comprehensible, achievable and measurable aims and objectives.

Provide adequate resources.

Communicate the aims, objectives, responsibilities, practices and procedures.

Promote OS&H in positive ways.

Establish effective ways of identifying, eliminating or controlling hazards and risks.

Planning

An effective OS&H plan should comprise:

•Clear, measurable and prioritised objectives

•A plan for achieving each objective

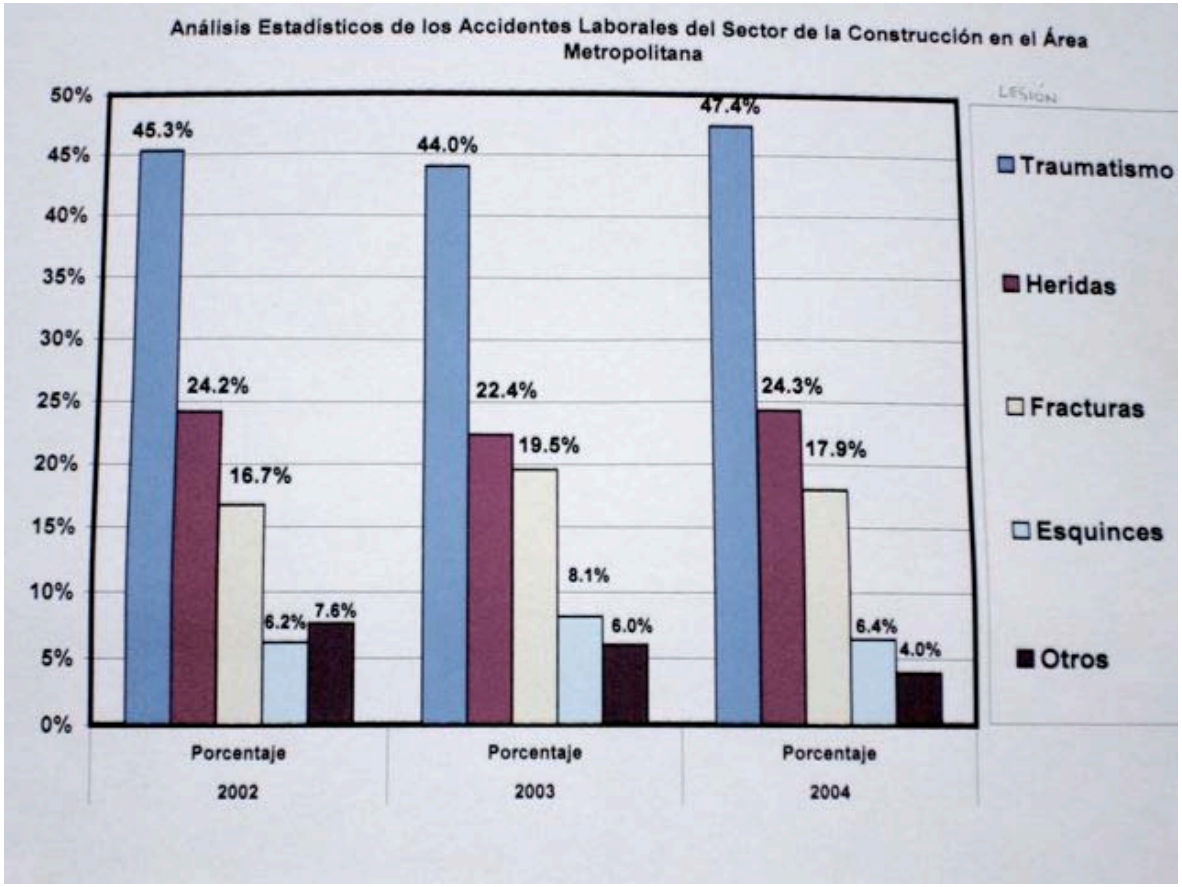
•A process for assessing achievements against the objectives

•Specification of the human, physical, financial and environmental resources required

•Improving OS&H performance usually requires changes, so it is important to have a plan for ‘managing change’

Evaluation

Procedures to monitor, measure and record OS&H performance on a regular basis should be developed, established and periodically reviewed. Responsibility, accountability and authority at different levels in the management structure should be allocated.



Accidents, incidents and other non-complying occurrences should be competently investigated and reported, and these reports used within the evaluation.

Action for improvement

These actions should be initiated by comprehensive audits by competent persons, internal to the organisation but independent of the specific project or section of the organisation; or preferably by persons external to the organisation. ILO-OSH 2001 gives a useful set of checklists for audit.

Case study

An example of an OS&H policy statement by a contractor is given in the handout.

Compare this statement to the requirements given in the previous slides.

[Note to the Tutor:

Ideally, this exercise should be based on the policy statement of a local company, but if one is not available, suitable examples can be found on the Internet.]

Hazards and risks

We all use the words ‘hazard’ and ‘risk’ in everyday conversations.

Spend a few moments thinking about what they mean and suggest a short definition for each.

Hazards and risks

A **hazard** is inherent potential to cause injury or damage to people's health.

Hazard assessment is a systematic evaluation of hazards.

Risk is a combination of the likelihood of an occurrence of a hazardous event and the severity of injury or damage to the health of people caused by this event.

Risk assessment is the process of evaluating the risks to safety and health arising from hazards at work.

Hazards and risks

The photo shows a cofferdam for the construction of a fish-pass in a spate river. This is an environmental project to allow migratory fish, such as salmon, to pass upstream in order to spawn, and of course the fishing brings an economic benefits from licence fees.

Hazards and risks

The photo shows a more detailed view of the cofferdam.

Hazards and risks

This spate river can rise as much as two metres in a few hours, so consideration has to be given to the risk that the cofferdam may flood. Although it is unlikely, there is a hazard - ‘inherent potential to cause injury or damage to people’s health’ - that the river rises unexpectedly and workers may be trapped inside.

Can the risk be reduced by building the cofferdam higher?

Risk is a combination of the likelihood of an occurrence of a hazardous event and the severity of injury or damage to the health of people caused by this event.

Obviously at low flows there is no immediate risk, but as the river rises the possibility of a sudden rise which will overtop the cofferdam increases.

Although a higher cofferdam may reduce the likelihood of the river flooding it, if this does occur it will be more difficult for the workers to escape from a deeper cofferdam and the possibility of drowning will increase, so the overall risk may be the same.

To make it totally safe, the cofferdam would have to be higher than any likely flood level, which may be quite uneconomic, so the use of careful safety measures, such as automatic water level warning sirens, good escape routes and careful attention to weather forecasts may be the most effective solution to reducing the risk.

This cofferdam was flooded twice. At an early stage in its construction, a severe winter storm caused very high river flows. It was made safe and work stopped until the summer. During this time, the fish-pass was redesigned by the client's design team to make it easier and safer to build.

Acknowledgements:
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Some OS&H hazards and construction projects

CATEGORY OF HAZARD	EXAMPLES
Hazards that may affect the project due to its location	Weather, flooding, active utilities, difficult access, aggressive neighbours,
Hazards that may affect the location due to the project	Pollution from site activities, danger to public from site activities and traffic
Hazards that may be caused by project briefing and design (by actions or negligence)	OS&H not considered at the outset, client and designers only consider end result not process of construction
Hazards that may be caused by project management and organisation (by actions or negligence)	Lack of senior management awareness and commitment, failure to implement diligent OS&H practices
Hazards inherent in construction methods (Ōactive hazardsÕ)	Safety of workers not considered in the method statement, unsafe equipment
Hazards inherent in construction components and materials (Ōembedded hazardsÕ)	Materials contain injuries chemicals, components heavy or require excessive force or special techniques
Hazards that may be caused by human behaviour	OS&H not taken seriously by managers, financial pressures on workers and supervisors
Wholly unpredictable or ŌlatentÕ hazards *Only such hazards cause ŌaccidentsÕ, all others cause preventable incidents*	Chemical or structural defects which were quite unknown at the briefing or design stage.

Assessment and management of hazards and risks

European Council Directive 89/391/EEC

The employer shall implement measures for:

- Avoiding risks
- Evaluating the risks which cannot be avoided
- Combating the risks at source
- Adapting the work to the individual, especially as regards the design of work places, the choice of work equipment and the choice of working and production methods
- Replacing the dangerous by the non-dangerous or the less dangerous
- Developing a coherent overall prevention policy
- Giving collective protective measures priority over individual protective measures
- Giving appropriate instructions to the workers

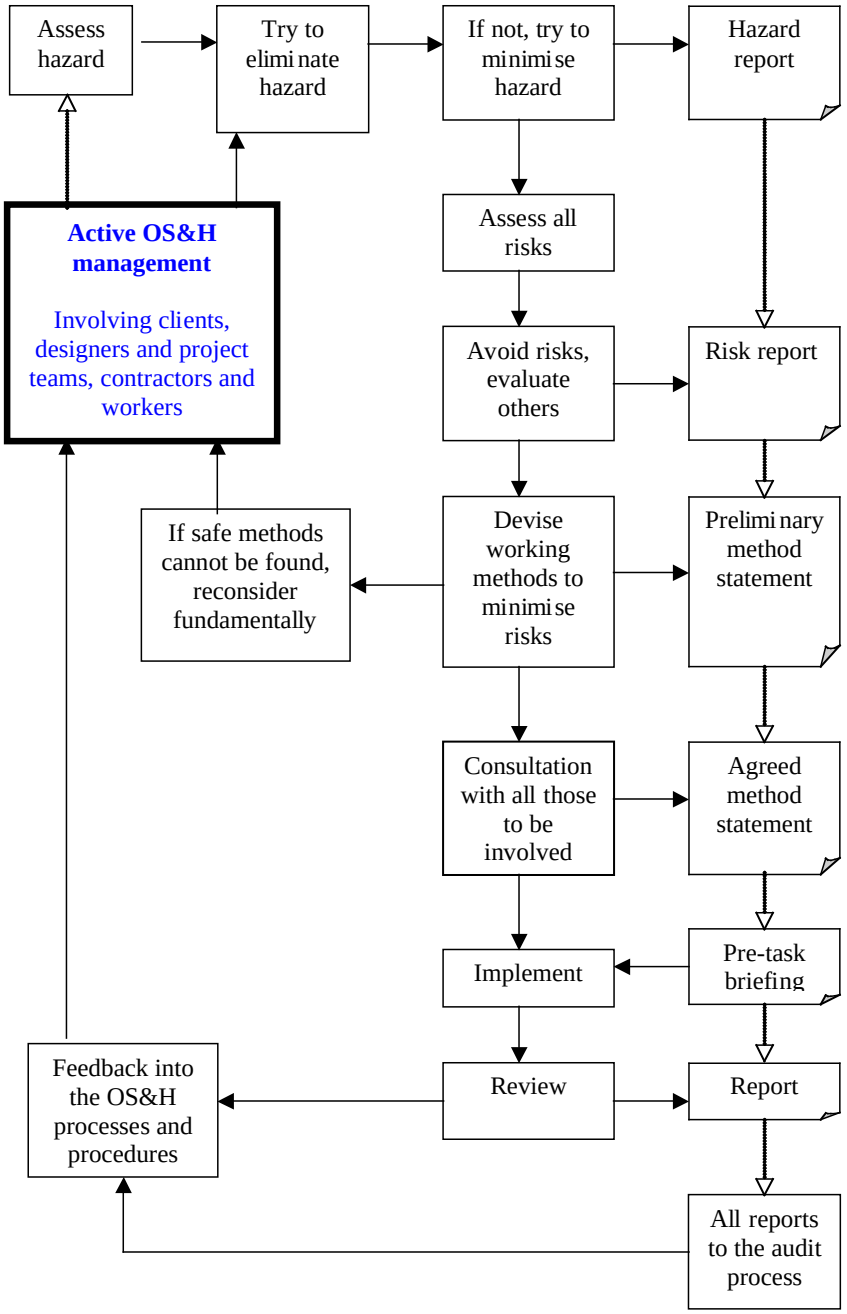
Assessment and management of hazards and risks

European Council Directive 89/391/EEC

The employer shall, taking into account the nature of the activities of the enterprise and/or establishment evaluate the risks to the safety and health of workers, and take appropriate steps to ensure that only workers who have received adequate instructions may have access to areas where there is serious and specific danger.

Measures related to safety, hygiene and health at work may in no circumstances involve the workers in financial cost.

The systematic construction OS&H process: elements and linkages



The systematic Construction OS&H process

The Method Statement is of crucial importance to this process.

This should comprise, as a minimum requirement, a clear, fully documented and agreed statement of the way in which a specific construction element shall be built, taking into account such aspects as:

- The assessment of the hazards and risks inherent in this element
- The sequence of construction and the plan of work
- The materials and components to be used
- The construction plant and equipment to be used
- Temporary works and their possible effects on the finished element

The systematic Construction OS&H process

The Method Statement continued

Provision of safe access, egress and work places

The sequence of dismantling, removal and in some cases disposal, of all the plant, equipment, temporary works and waste

A full statement of compliance with the policy and other requirements of the OS&H plan

A full statement of all those who will be involved, their roles and confirmation that all have been fully consulted and properly briefed

The systematic Construction OS&H process

In the process, ‘competent persons’ devise the working methods to produce a preliminary method statement, which is then discussed with all those involved (or their appointed representatives). This consultation has two possible outcomes: either an agreed, safe and healthy method statement; or a decision that no acceptable method can be found so the whole process has to be reconsidered fundamentally, starting with an assessment of the inherent hazards. It is through engaging in iterative processes such as this that difficult problems may be solved.

Software systems for OS&H

Comprehensive software systems are available. Functions include:

- Generating forms for the formulation of policies, procedures and all the systems required
- Prompting for updating for these records
- Offering periodic reviews and reports according to an agreed format and timescale
- Holding data on employees
- Operating emergency procedures