SEMINAR ON OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM
ISO 45001:2018

Shah Alam Convention Center (SACC)
17 October 2019

BACKGROUND

- An organization is **responsible** for ensuring safe and healthy workplace

- >2.78 million deaths per year (ILO statistic 2017) as a result of work activities

- ISO 45001 is developed to **manage OH&S risks**, improve OH&S performance

- Important for organization to eliminate or minimize OH&S risks by taking appropriate **preventive measures**

- Emphasizes the need for **worker participation**

Why Worry about OSH?

- Moving traffic vehicles
- Hit by falling/flying object
- Slip, trip, fall
- Fall from height
- Chemicals
- Machineries
- Confine space
- Weather condition
- etc…..

Why Worry about OSH?

- Laborer dies after being run over by a backing dump truck during a night time paving project
- Traffic control supervisor dies when struck by an asphalt dump truck while picking up cones on a roadway work zone
- Highway construction supervisor dies after being backed over by a water truck
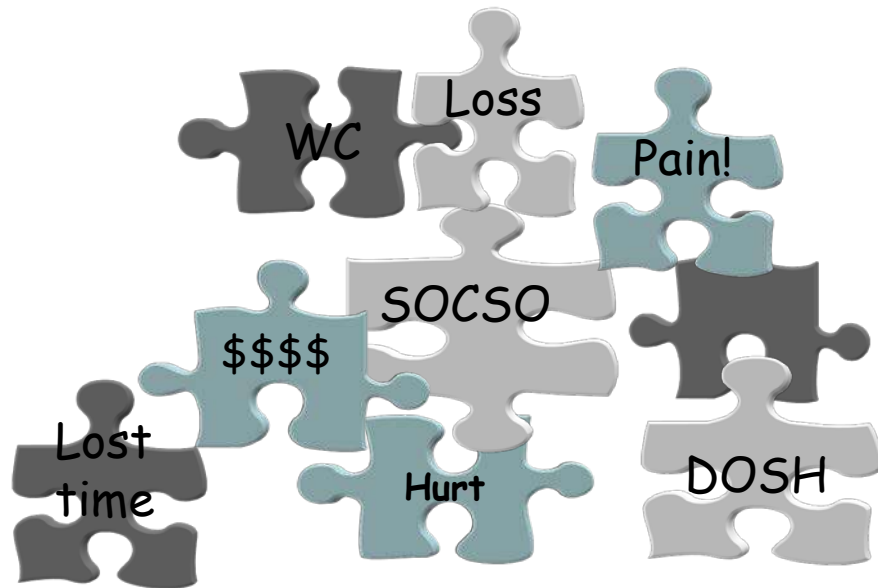
Why Worry about OSH?

- Laborer on roadway construction work site run over and killed by a backing flat bed dump truck
- Flagman dies after being run over by a dump truck
- Soil compactor overturn kills operator
- Guardrail installers die after being struck by a guardrail

Why Worry about OSH?

- Why do you need to be concerned about safety and health?

Why Worry: Common Reasons

1. Getting hurt isn't fun!!!

<u>Not All Pain is Gain</u>
Nobody likes getting hurt

Healthy employees are more productive employees

Why Worry: Common Reasons

1. Getting hurt isn't fun!!!
2. **Cost of Accidents**

WHAT DO ACCIDENTS COST YOU?

Unseen costs can sink the ship!

Direct - Insured Costs

"Just the tip of the iceberg"

Indirect - Uninsured, hidden Costs - Out of pocket

Examples:
1. Time lost from work by injured employee.
2. Lost time by fellow employees.
3. Loss of efficiency due to break-up of crew.
4. Lost time by supervisor.
5. Training costs for new/replacement workers.
6. Damage to tools and equipment.
7. Time damaged equipment is out of service.
8. Loss of production for remainder of the day.
9. Damage from accident: fire, water, chemical, explosives, etc.
10. Failure to fill orders/meet deadlines.
11. Overhead costs while work was disrupted.
12. Other miscellaneous costs (Over 100 other items of cost may appear one or more times with every accident)
13. Others? _____

Unknown Costs -
1. Human Tragedy
2. Morale
3. Reputation

Cost of Accidents

- Direct Costs
  - Medical Costs (including worker's compensation)
  - Indemnity Payments
- Indirect Costs
  - Time Lost
  - Schedule delays
  - Training new employees
  - Cleanup time / equipment repairs
  - Product / material damage
  - Legal fees

Why Worry: Common Reasons

1. Getting hurt isn't fun!!!
2. Cost of Accidents
3. **Legal Issues and Liability**

Legal Issues and Liability

- As a result of OHS violations:

    – You can be named in a lawsuit
    – Criminal charges may be filed against you
    – You can be cited by an enforcement agency
    – You can be fined by an enforcement agency
    – Your workplace can be shut down by an enforcement agency

Legal Issues and Liability

- Because of personal liability, and you can be named as a defendant in a lawsuit
  - *Wherever you work, it does not protect you.*

Legal Issues and Liability

- You can have criminal charges filed against you.
  - Negligent supervisors and employers have been charged with manslaughter

Legal Issues and Liability

- You can be cited by an enforcement agency

  – Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP)

    • They have been here before..

Legal Issues and Liability

- Cease and desist orders: if the violations are serious enough, agencies such as JKKP can (and will) shut down the workplace/site until the problems are corrected.

Tapak pembinaan diarah tutup

Projek pangsapuri mewah dikesan lakukan pelbagai kesalahan dalam ops bersepadu CIDB

AHMAD ISMADI ISMAIL

AMPANG – Sebuah tapak pembinaan pangsapuri mewah, di sini, diarah tutup dan

dan Keselamatan Pekerjaan (Dosh), Jabatan Pendaftaran Negara dan Suruhanjaya Pencegahan Rasuah Selangor. Mohd Zaid berkata, pihak-

SH 1/12/16   M/S 48.

Diarah tutup sementara

Tiga tapak pembinaan dipercayai jadi sarang pembiakan aedes

AMPANG – Sebanyak tiga tapak pembinaan dikenakan tindakan penutupan sementara oleh Pejabat Kesihatan Gombak dan Hulu Langat, selepas dipercayai menjadi sarang pembiakan nyamuk aedes.

Beliau berkata, pihaknya komited dalam usaha mengurangkan kadar kes denggi di kawasan pentadbiran MPAJ. "Kita turut mengadakan Operasi Mega Bersepadu di Kampung Tasek.

mam denggi yang dilaporkan di kawasan MPAJ sehingga 19 November lalu (Minggu Epid ke-46) adalah sejumlah 3,628 dengan 11 kematian dilaporkan.

So how do you protect yourself?

…remember, OSH is everybody's business….

OCCUPATIONAL
SAFETY AND HEALTH MANAGEMENT

Why We Need OSH Management?

- Many lives lost annually due to workplace accidents, work related cancer, etc

- JKKP accident statistics 2018
    - D : 260
    - PD : 234
    - NPD : 4537

- Thousands of injuries and diseases per annum

Statistics from JKKP

- ..\Penang_230819\Official Website Department of Occupational Safety and Health - Sector.pdf

- ..\Penang_230819\Official Website Department of Occupational Safety and Health - National Occupational Accident & Fatality Rate.pdf

Lost Time Injury

- Work injury other than permanent partial disability which renders the injured person temporarily unable to perform a regular job after the day on which the injury was received. E.g.: 1 full day MC is already considered an LTI case

1,000,000 HRS
LOST TIME INCIDENT FREE

Why We Need OSH Management?

- Planning to prevent accidents and ill health as opposed to reacting after occurrence

- All activities in an organization have OSH implications

- Control on OSH as important as financial, quality, purchasing, etc

- Therefore, OSH is a management function

OSHMS

- Standards
    - OHSAS 18001:2007 (not valid after Mac 2021)
    - MS 1722:2011 (not valid after Mac 2021)
    - ISO 45001:2018

OHSAS 18001:2007 / ISO 45001:2018

- Organizations increasingly concerned with OHS performance
- Increasingly stringent legislation
- Development of economic policies
- Increased concern by interested parties
- Over 50,000 organizations worldwide are certified to OHSAS 18001:2007 / ISO 45001:2018

OHSAS 18001:2007 / ISO 45001:2018

- Enable organization to develop & implement OHSMS
- Apply to all type and sizes of organization
- Basis of the approach – PDCA – risk based

OHSAS 18001:2007 / ISO 45001:2018

- Commitment from Top Management and employees is paramount
- Enables performance improvement
- Overall aim – support and promote good OHS practice

Definitions

- Hazard
  - Source, situation, or act with a potential for harm in terms of human injury or ill health, or a combination of both
- Hazard identification
  - Process of recognizing that a hazard exist and defining its characteristics

Definitions

- Incident
  - Work-related events in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred
    - *NOTE 1 – an accident is an incident which has given rise to injury, ill health or fatality*
    - *NOTE 2 – an incident where no injury, ill health or fatality occurs may also be referred to as a "near miss", "near hit", "close call" or "dangerous occurrence"*
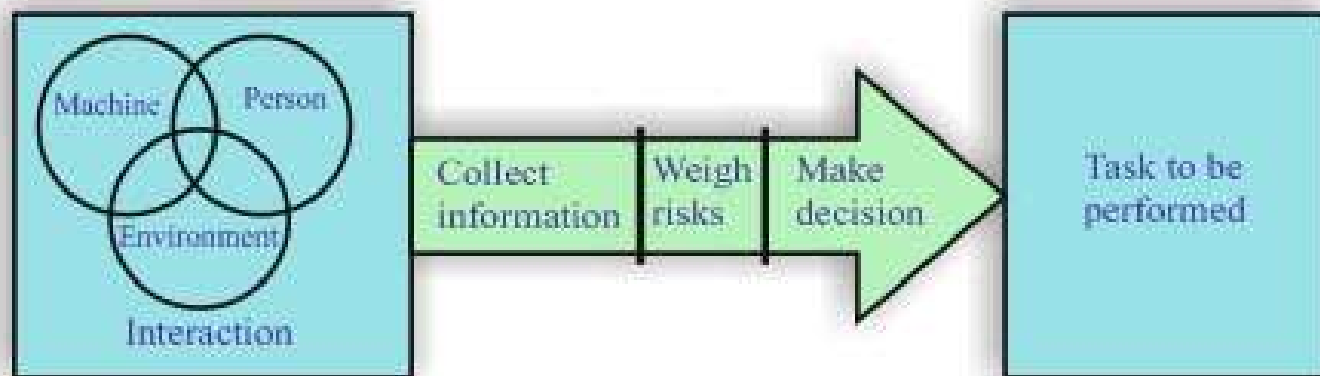   - *NOTE 3 – an emergency situation*

WHAT IS ISO 45001?

- an international standard that specify requirements for an OH&S management system
- a standard to enable organization to proactively improve its OH&S performance in **preventing** injury and ill-health
- intended to be used by any organization
- all of its requirements are intended to be integrated into an organization's own management processes

System Theory Model

Machine Person

Environment

Interaction

Collect information Weigh risks Make decision

Task to be performed

WHAT ISO 45001 IS NOT…

- Does not state specific criteria for OH&S performance
- Does not specifically address issues such as product safety, property damage or environmental impact (unless they present a risks to its workers)
- Is not intended to be a legally binding document, it is a management tool for voluntary use

WHAT WILL BE THE BENEFITS OF USING ISO 45001?

Enable organization to **improve its OHS performance** by;

- developing and implementing OHS policy and objectives

- establishing systematic processes which consider its "context" and which take into account its risks and opportunities, and its legal and other requirements

- determining the hazards and OHS risks associated with its activities ; seeking to eliminate them, or putting in controls to minimize their potential effects

- establishing operational controls to manage its OHS risks and its legal and other requirements

- increasing awareness of its OHS risks

- evaluating its OHS performance and seeking to improve it, through taking appropriate actions

- ensuring workers take an active role in OHS matters

WHAT WILL BE THE BENEFITS OF USING ISO 45001?

More direct benefits e.g.;

- improving its ability to respond to regulatory compliance issues

- reducing the overall costs of incidents

- reducing downtime and the costs of disruption to operations

- reducing the cost of insurance premiums

- reducing absenteeism and employee turnover rates

- recognition for having achieved an international benchmark (which may in turn influence customers who are concerned about their social responsibilities)

WHO ARE THE INTENDED USERS OF THE ISO 45001 STANDARD?

- the simple answer is all organizations.
- micro business, or a global conglomerate ; a non-profit organization, a charity, an academic institution, or a government department
- organization has people working on its behalf, or who may be affected by its activities, then using a systematic approach to managing health and safety will bring benefits to it
- can be used by small low risk operations equally as well as by high risk and large complex organizations
- consistent with the way organizations manage their other "business" risks and hence encourages the integration of the standard's requirements into organizations' overall management processes.

HOW DOES ISO 45001 RELATE TO OTHER STANDARD?

- follows the HLS approach that is being applied to other ISO management system standards, such as ISO 9001 (quality) and ISO 14001 (environment)

- consideration has been given to the content of other international standards (such as OHSAS 18001 or ILO – OSH Guidelines and national standards, as well as to the ILO's International Labour standards and conventions (ILSs).

- its requirements consistent with the other standards

- allow for a relatively easy migration from using an existing OHS management system standard

- allow for the alignment and integration with the requirements of other ISO management system standards into their organization's overall management processes

MS ISO 45001:2018

AIM OF OH&S MS

Purpose of OHS MS = to provide a framework for managing OHS risks.

Intended outcomes of OH&S MS
- to prevent injury and/or ill health to workers;
- to provide safe and healthy workplaces; and;
- to continually improve OH&S performance.

SUCCESS FACTORS

Key factors effecting success of OHS MS;

- top management leadership, commitment, responsibilities and accountability;

- top management developing, leading and promoting culture that supports the intended outcomes of the OHS MS;

- communication;

- consultation and participation of workers;

- allocation of the necessary resources;

- OHS policies, which are compatible with the overall strategic direction of the organization;

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ANNEX SL: HIGH LEVEL STRUCTURE CLAUSES

1	Scope
2	Normative references
3	Terms and definitions
4	Context of the organization
5	Leadership
6	Planning
7	Support
8	Operation
9	Performance evaluation
10	Improvement

ANNEX SL HIGH LEVEL STRUCTURE	MS ISO 45001
1 SCOPE	1 SCOPE
2 NORMATIVE REFERENCES	2 NORMATIVE REFERENCES
3 TERMS AND DEFINITIONS	3 TERMS AND DEFINITIONS
4 CONTEXT OF THE ORGANIZATION	4 CONTEXT OF THE ORGANIZATION
5 LEADERSHIP	5 LEADERSHIP AND WORKER PARTICIPATION
6 PLANNING	6 PLANNING
7 SUPPORT	7 SUPPORT
8 OPERATION	8 OPERATION
9 PERFORMANCE EVALUATION	9 PERFORMANCE EVALUATION
10 IMPROVEMENT	10 IMPROVEMENT

ANNEX SL HIGH LEVEL STRUCTURE	MS ISO 45001:2018	MS ISO 14001:2015
1 SCOPE	1 SCOPE	1 SCOPE
2 NORMATIVE REFERENCES	2 NORMATIVE REFERENCES	2 NORMATIVE REFERENCES
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5 LEADERSHIP	5 LEADERSHIP AND WORKER PARTICIPATION	5 LEADERSHIP
6 PLANNING	6 PLANNING	6 PLANNING
7 SUPPORT	7 SUPPORT	7 SUPPORT
8 OPERATION	8 OPERATION	8 OPERATION
9 PERFORMANCE EVALUATION	9 PERFORMANCE EVALUATION	9 PERFORMANCE EVALUATION
10 IMPROVEMENT	10 IMPROVEMENT	10 IMPROVEMENT

MANAGEMENT SYSTEM INTEGRATION
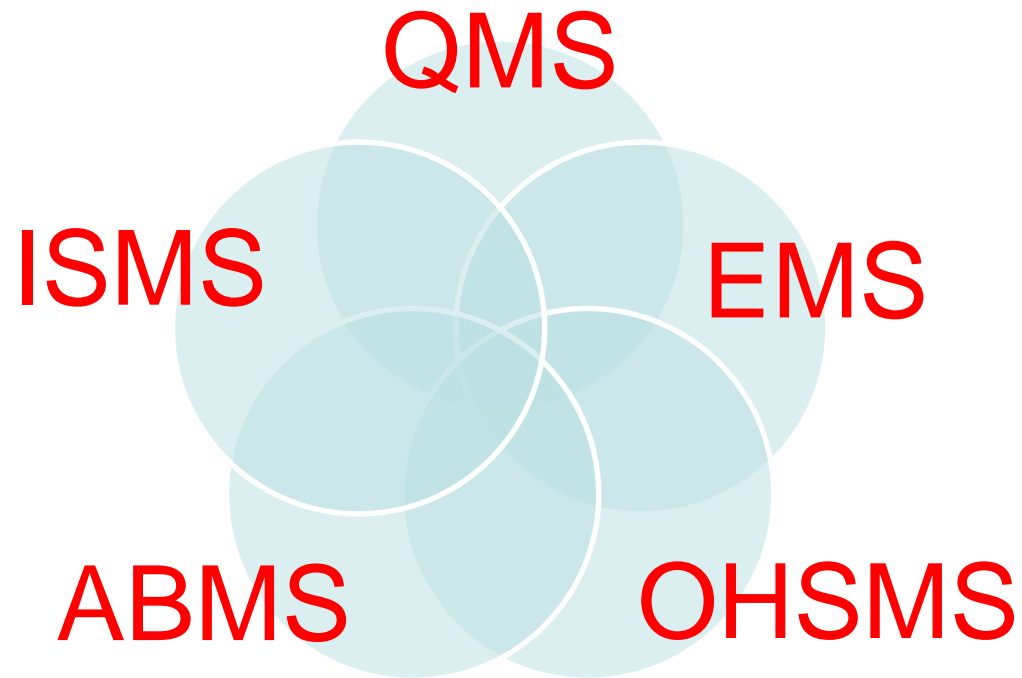
DOCUMENTATION
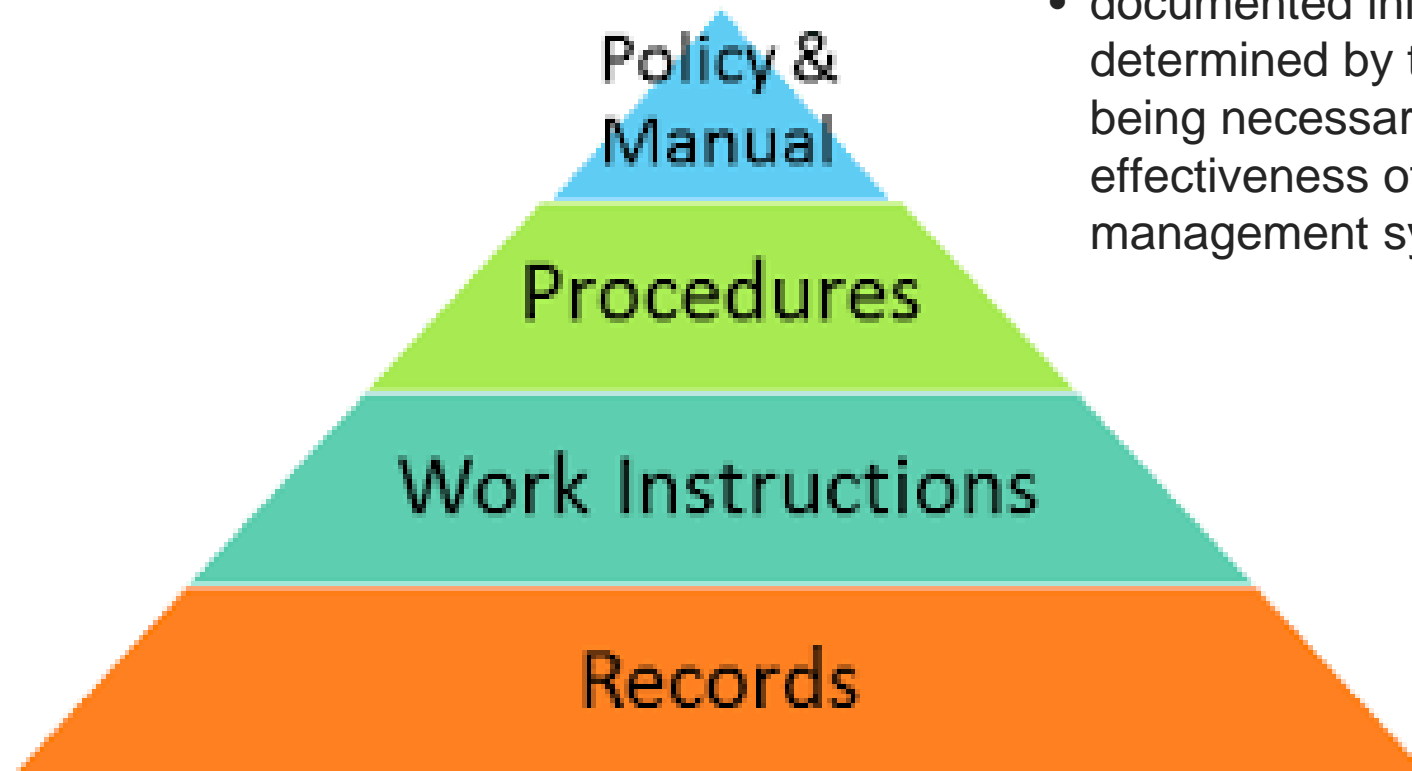
OHS management system shall include:

- documented information required by MS ISO 45001:2018;
- documented information determined by the organization as being necessary for the effectiveness of the OH&S management system

Documented information – processes needed (Procedures)

1. Risks and opportunities
2. Hazard identification
3. Assessment of risks and opportunities
4. Risks control (and criteria) including elimination of hazard and reduction of risks
5. Legal and other requirements
6. Consultation and participation of workers
7. Internal and external communication
8. Management of change
9. Procurement
10. Emergency preparedness and response
11. Monitoring, measurement, analysis and performance evaluation
12. Incident and nonconformities

Documented information–to maintain, to retain (Records)

1. Scope of OH&S management system (4.3) **Scope of OHS.pptx**
2. Policy (5.2)**Policy.pptx**
3. Objectives (6.2.2)**HSE Objectives.ppt Objective.pptx**
4. Responsibilities and authorities for relevant roles within the OHS management system (5.3)**Responsibility.doc**
5. Competence (7.2)**Job requirement.doc**
6. Risks and opportunities (6.1)**Risk Register.xlsx**
7. Risk controls (8.1)
8. Legal and other requirements (6.1.3)
9. Evaluation of compliance on legal and other requirements (9.1.2)

Documented information–to maintain, to retain (Records)

10. Communication (7.4)

11. Emergency preparedness and response (8.2)

12. Results of monitoring, measurement, analysis and performance evaluation (9.1)

13. Maintenance, calibration or verification of measuring equipment (9.1)

14. Result of compliance evaluation (9.1.2)

15. Internal audit programme and the results (9.2)

16. Management reviews (9.3)

17. Incidents or nonconformities (10.2)

18. Continual improvement (10.3)

Scope of the OH&S management system (4.3/4.4)

Understanding the organization and its context

CLAUSE 4
Context of the organization

Needs and expectations of workers and other interested parties

P

CLAUSE 6
Planning

CLAUSE 7
Support

CLAUSE 5
Leadership and worker participation

CLAUSE 8
Operation

CLAUSE 10
Improvement

A

D

CLAUSE 9
Performance evaluation

C

Intended outcomes of the OH&S management system

PDCA CONCEPT

ACTION
PLAN
CHECK
DO

- Take action to continually improve OH&S performance to achieve the intended outcomes
- Determine and assess OH&S risks, opportunities
- Establish OH&S objectives and processes
- Monitor and measure activities and processes
- Report the results
- Implement the processes as planned

SIRIM QAS INTERNATIONAL

TERMS AND DEFINITIONS

Worker

Person performing work or work-related activities that are under the control of the *organization*

Note 1 : Persons perform work or work-related activities under various arrangements, paid or unpaid, such as regularly or temporarily, intermittently or seasonally, casually or non part-time basis.

Note 2 : Workers include top management (3.12), managerial and non-managerial persons.

Note 3 : The work or work-related activities under the control of the organization may be performed by workers employed by the organization, or other persons, including workers from external providers, contractors, individuals, and agency workers.

ISO 45001:2018 CLAUSES

|	
Scope	**(Clause 1)**
Normative references	**(Clause 2)**
Terms and definition	**(Clause 3)**
Context of the organization	**(Clause 4)**
Leadership and worker participation	**(Clause 5)**
Planning	**(Clause 6)**
Support	**(Clause 7)**
Operation	**(Clause 8)**
Performance evaluation	**(Clause 9)**
Improvement	**(Clause 10)**

Context of the organization (Clause 4)

- ☑ Understanding the organization and its context
- ☑ Understanding the needs and expectation of workers and other interested parties
- ☑ Determining the scope of OH&S management system
- ☑ OH&S management system

4.1 Understanding the organization and its context

The organization shall determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcome(s) of its OHS management system.
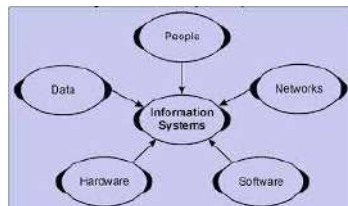
INTERNAL & EXTERNAL ISSUES

culture

NEW TECHNOLOGIES
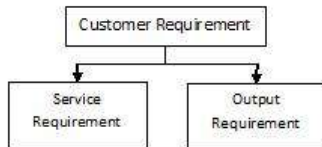
4.1 Understanding the organization and its context

External issues (examples)	
cultural, social, political, legal, financial, technological, economic and natural surroundings and market competition, whether international, national, regional or local;	key drivers and trends relevant to the industry or sector having impact on the organization;
introduction of new competitors, contractors, subcontractors, suppliers, partners and providers, new technologies, new laws;	relationships with, as well as perceptions and values of, its external interested parties.
new knowledge on products and their effect on health and safety;	

4.1 Understanding the organization and its context
Internal issues

4.1 Understanding the organization and its context

Internal issues (examples);

- governance, organizational structure, roles and accountabilities;
- policies, objectives and the strategies that are in place to achieve them;
- the capabilities, in terms of resources, knowledge and competence (e.g. capital, time, human resources, processes, systems and technologies);
- information systems, information flows and decision-making processes (both formal and informal);
- introduction of new products, materials, services, tools, software, premises and equipment;
- relationships with, as well as perceptions and values of, workers;
- the culture in the organization;
- standards, guidelines and models adopted by the organization;
- the form and extent of contractual relationships, including, for example, outsourced activities;
- working time arrangements;
- working conditions

4.2 Understanding the needs and expectation of workers and other interested parties

The organization shall determine:

- the other interested parties, in addition to workers, that are relevant to the OHS MS;
- the relevant needs and expectations (i.e. requirements) of workers and other interested parties;
- which of these needs and expectations are or could become legal requirements and other requirements.

4.2 Understanding the needs and expectations of workers and other interested parties

Interested parties (in addition to workers) can include:

legal and regulatory authorities (local, regional, state/provincial, national or international);

parent organizations;

suppliers, contractors and subcontractors;

workers' representatives;

workers' organizations (trade unions) and employers' organizations;

owners, shareholders, clients, visitors,

local community and neighbours of the organization and the general public;

customers, medical and other community services, media, academia, business associations and NGOs;

occupational health and safety organizations, occupational safety and health-care professionals.

4.2 Understanding the needs and expectations of workers and other interested parties

Relevant <u>needs and expectations</u>:

- Some needs and *expectations* are <u>mandatory</u>; e.g. laws and regulations.
- Organization may also decide to <u>voluntarily</u> agree to, or adopt, other needs and expectations (e.g. subscribing to a voluntary initiative).
- Once the organization adopts them they are addressed when planning and establishing the OH&S management system.

4.3 Determining the scope of OHS MS

The organization shall determine the boundaries and applicability of the OHS MS to establish its scope.

When determining this scope, the organization shall:

- consider the external and internal issues;
- take into account the requirements of workers and other interested parties;
- take into account the planned or performed work related activities.

The OHS MS shall include the activities, products and services within the organization's control or influence that can impact the organization's OHS performance.

The OHS MS shall include the activities, products and services within the organization's control or influence that can impact the organization's OHS performance.

The scope shall be available as documented information.

4.4 OHS management system

The organization shall establish, implement, maintain and continually improve an OH&S management system, including the **processes** needed and their interactions, in accordance with the requirements of ISO 45001.

Context of the organization (Clause 4)

- ☑ Understanding the organization and its context
- ☑ Understanding the needs and expectation of workers and other interested parties
- ☑ Determining the scope of OHS management system
- ☑ OHS management system

Leadership and worker participation (Clause 5)

☑Leadership and commitment

☑OHS policy

☑Organizational roles, responsibilities and authorities

☑Consultation and participation of workers

5.1 Leadership and commitment

5.1 Leadership and commitment

<u>Top management</u> shall demonstrate leadership and commitment with respect to the OH&S management system by:

- taking overall responsibility and accountability for the prevention of work-related injury and ill health as well as the provision of safe and healthy workplaces and activities;

- ensuring that the OHS policy and related OHS objectives are established and are compatible with the strategic direction of the organization;

- ensuring the integration of the OHS management system requirements into the organization's business processes;

5.1 Leadership and commitment

(cont):

- ensuring that the resources needed to establish, implement, maintain and improve the OHS management system are available;
- communicating the importance of effective OHS management and of conforming to the OHS management system requirements;
- ensuring that the OHS management system achieves its intended outcome(s);
- directing and supporting persons to contribute to the effectiveness of the OHS management system;
- ensuring and promoting continual improvement;

5.1 Leadership and commitment

(cont):

- supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility;

- developing, leading and promoting a culture in the organization that supports the intended outcomes of the OHS MS;

- protecting workers from reprisals when reporting incidents, hazards, risks and opportunities;

5.1 Leadership and commitment

(cont):

- ensuring the organization establishes and implements a process(es) for consultation and participation of workers;

- supporting the establishment and functioning of health and safety committees,

NOTE Reference to "business" in this document can be interpreted broadly to mean those activities that are core to the purposes of the organization's existence.

5.2 OHS policy

Top management shall establish, implement and maintain an OHS policy that:

- includes a commitment to provide safe and healthy working conditions for the prevention of work related injury and ill health and is appropriate to the purpose, size and context of the organization and to the specific nature of its OHS risks and OHS opportunities;

- provides a framework for setting the OHS objectives;

- includes a commitment to fulfil legal requirements and other requirements;

- includes a commitment to eliminate hazards and reduce OHS risks;

5.2 OHS policy Policy.pptx

(contd):

- includes a commitment to continual improvement of the OHS MS;
- includes a commitment to consultation and participation of workers, and, where they exist, workers' representatives.
- The OHS policy shall:
  - be available as documented information;
  - be communicated within the organization;
  - be available to interested parties, as appropriate;
  - be relevant and appropriate.

5.3 Organizational roles, responsibilities and authorities

Top management shall ensure that the responsibilities and authorities for relevant roles within the OHS MS are assigned and communicated at all levels within the organization and maintained as documented information. Workers at each level of the organization shall assume responsibility for those aspects of OHS MS over which they have control.

NOTE While responsibility and authority can be assigned, ultimately top management is still accountable for the functioning of the OHS management system.

5.3 Organizational roles, responsibilities and authorities

Top management shall assign the responsibility and authority for:

- ensuring that the OHS MS conforms to the requirements of this document;

- reporting on the performance of the OHS MS to top management.

- *Responsibility.doc*

5.4 Consultation and participation of workers

The organization shall establish, implement and maintain a process(es) for consultation and participation of workers at all applicable levels and functions, and, where they exist, workers' representatives, in the development, planning, implementation, performance evaluation and actions for improvement of the OHS MS.

TERMS AND DEFINITIONS

Participation

Involvement in decision-making.

Consultation

Seeking views before making any decision.

Note : Consultation and participation includes engaging health and safety committees and workers' representatives, where they exists.

5.4 Consultation and participation of workers

The organization shall:

- provide mechanisms, time, training and resources necessary for consultation and participation;

NOTE 1   Worker representation can be a mechanism for consultation and participation.

- provide timely access to clear, understandable and relevant information about the OHS MS;

- determine and remove obstacles or barriers to participation and minimize those that cannot be removed;

NOTE 2   Obstacles and barriers can include failure to respond to worker inputs or suggestions, language or literacy barriers, reprisals or threats of reprisals and policies or practices that discourage or penalize worker participation.

Leadership and worker participation (Clause 5)

☑Leadership and commitment

☑OHS policy

☑Organizational roles, responsibilities and authorities

☑Consultation and participation of workers

Planning (Clause 6)

☑ Actions to address risks and opportunities
- General
- Hazard identification and assessment of risk and opportunities
  - Hazard identification
  - Assessment of OHS risks and other risks to the OHS MS
  - Assessment of OHS opportunities and other opportunities to the OHS MS
- Determination of legal requirements and other requirements
- Planning action

☑ OHS objectives and planning to achieve them
- OH&S objectives
- Planning to achieve OH&S objectives

Actions to address risks and opportunities

When planning for the OHS MS, the organization shall consider the issues referred to in; (context), the requirements referred to in (interested parties) and (the scope of its OHS MS) and determine the risks and opportunities that need to be addressed to:

- give assurance that the OHS MS can achieve its intended outcome(s);
- prevent, or reduce, undesired effects;
- achieve continual improvement.

TERMS AND DEFINITIONS

Risk

effect of uncertainty

Note : Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated "likelihood" of occurrence.

Note : In this document, where the term "risks and opportunities" is used this means OH&S risks, OH&S opportunities and other risks

6.1 Actions to address risks and opportunities

When determining the risks and opportunities to the OH&S MS and its intended outcomes that need to be addressed, the organization shall take into account:

- hazards;
- OHS risks and other risks;
- OHS opportunities and other opportunities;
- legal requirements and other requirements.

TERMS AND DEFINITIONS

occupational health and safety risk

[OHS risk]
combination of the likelihood of occurrence of a work-related hazardous event or exposure(s) and the severity of injury and ill health that can be caused by the event or exposure(s)

occupational health and safety opportunity

[OHS opportunity]
circumstance or set of circumstances that can lead to improvement of OHS performance

6.1 Actions to address risks and opportunities

The organization, in its planning process(es), shall determine and assess the risks and opportunities that are relevant to the intended outcomes of the OHS MS associated with changes in the organization, its processes or the OHS MS.

In the case of planned changes, permanent or temporary, this assessment shall be undertaken before the change is implemented.

6.1 Actions to address risks and opportunities

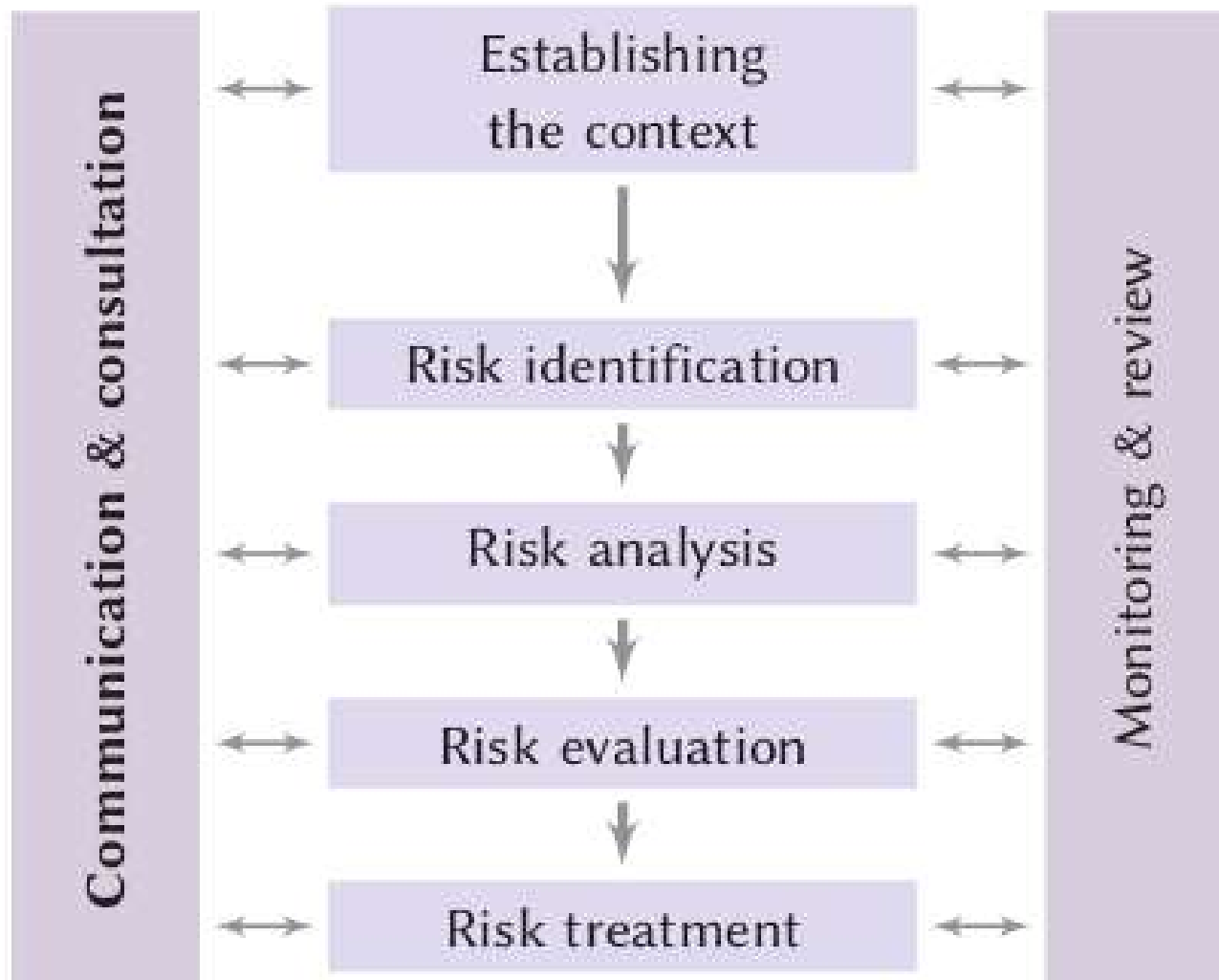The organization shall maintain documented information on:

- risks and opportunities;
- the process(es) and actions needed to determine and address its risks and opportunities to the extent necessary to have confidence that they are carried out as planned.

6.1 Actions to address risks and opportunities

Examples of 'opportunities';

- integrating OHS requirements at the earliest stage of planning for facilities relocation, process re-design or replacement of machinery and plant;
- using new technologies to improve OHS performance;
- improving the OHS culture, such as by extending competence related to OHS beyond requirements or encouraging workers to report incidents in a timely manner;
- improving the visibility of top management's support for the OHS MS;
- enhancing the incident investigation process(es);
- improving the process(es) for worker consultation and participation;
- benchmarking, including consideration of both the organization's own past performance and that of other organizations;
- collaborating in forums that focus on topics dealing with OHS.

Risk Management – ISO 31000:2018

6.1.2 Hazard identification

The organization shall establish, implement and maintain a process(es) for hazard identification that is ongoing and proactive. The process(es) shall take into account but not be limited to:

- how work is organized, social factors (including workload, work hours, victimization, harassment and bullying), leadership and the culture in the organization;
- routine and non-routine activities and situations, including hazards arising from:
  - infrastructure, equipment, materials, substances and the physical conditions of the workplace;
  - product and service design, research, development, testing, production, assembly, construction, service delivery, maintenance and disposal;
  - human factors;
  - how the work is performed;

6.1.2 Hazard identification

(contd):

- past relevant incidents, internal or external to the organization, including emergencies, and their causes;
- potential emergency situations;
- people, including consideration of:
  - those with access to the workplace and their activities, including workers, contractors, visitors and other persons;
  - those in the vicinity of the workplace who can be affected by the activities of the organization;
  - workers at a location not under the direct control of the organization;

6.1.2 Hazard identification

(contd):

- other issues, including consideration of:
  - the design of work areas, processes, installations, machinery/equipment, operating procedures and work organization, including their adaptation to the needs and capabilities of the workers involved;
  - situations occurring in the vicinity of the workplace caused by work-related activities under the control of the organization;
  - situations not controlled by the organization and occurring in the vicinity of the workplace that can cause injury and ill health to persons in the workplace;
- actual or proposed changes in organization, operations, processes, activities and OH&S MS;
- changes in knowledge of, and information about, hazards.

6.1.2.2 Assessment of risks and other risks to the OHS MS

- The organization shall establish, implement and maintain a process(es) to:
  - assess OHS risks from the identified hazards, while taking into account the effectiveness of existing controls;
  - determine and assess the other risks related to the establishment, implementation, operation and maintenance of the OH&S MS.
- The organization's methodology(ies) and criteria for the assessment of OHS risks shall be defined with respect to their scope, nature and timing to ensure they are proactive rather than reactive and are used in a systematic way.
- Documented information shall be maintained and retained on the methodology(ies) and criteria.

6.1.2.3.Assessment of OHS opportunities and other opportunities to the OHS MS

The organization shall establish, implement and maintain a process(es) to assess:

- OHS opportunities to enhance OHS performance, while taking into account planned changes to the organization, its policies, processes or its activities and:

  – opportunities to adapt work, work organization and work environment to workers;

  – opportunities to eliminate hazards and reduce OH&S risks;

- other opportunities for improving the OH&S management system.

NOTE OH&S risks and OH&S opportunities can result in other risks and other opportunities to the organization.

Risk Rating Table (example)

Likelihood \ Consequence	1 (Insignificant)	2 (First aid injury)	3 (Minor injury/ ill health)	4 (Major injury/ ill health)	5 (Fatalities)
1 (Unlikely to occur but possible)	1	2	3	4	5
2 (unlikely but can reasonably expected to occur)	2	4	6	8	10
3 (Will occur several times)	3	6	9	12	15
4 (Will occur frequently)	4	8	12	16	20
5 (Continually experienced)	5	10	15	20	25

Category & Issue / Requirement	RISK IDENTIFICATION		RISK ASSESSMENT				PLAN ACTIONS Medium & High Risk i) Avoid Risk ii)Transfer Risk iii) Mitigate Risk Low Risk iv) Accept Risk		Business Process/ Responsibility/ Timeline/ Frequency
	Risk	Opportunity	Likelihood (A)	Consequences (B)	Score (AXB)	Index			

6.1.3 Determination of legal and other requirements

The organization shall establish, implement and maintain a process(es) to:

- determine and have access to up to-date legal requirements and other requirements that are applicable to its hazards, OHS risks and OHS MS;

- determine how these legal requirements and other requirements apply to the organization and what needs to be communicated;

- take these legal requirements and other requirements into account when establishing, implementing, maintaining and continually improving its OHS MS.

The organization shall maintain and retain documented information on its legal requirements and other requirements and shall ensure that it is updated to reflect any changes.

NOTE Legal requirements and other requirements can result in risks and opportunities to the organization.

6.1.4 Planning action

The organization shall plan:

- actions to:
  - address these risks and opportunities;
  - address legal requirements and other requirements;
  - prepare for and respond to emergency situations;
- how to:
  - integrate and implement the actions into its OH&S MS processes or other business processes;
  - evaluate the effectiveness of these actions;

The organization shall take into account the <u>hierarchy of controls</u> and outputs from the OHS MS when planning to take action.

When planning its actions, the organization shall consider best practices, technological options, and financial, operational and business requirements.

6.2 OHS objectives

The organization shall establish OHS objectives at relevant functions and levels in order to maintain and continually improve the OHS MS and OHS performance:

The OHS objectives shall:

a) be consistent with the OHS policy;

b) be measurable (if practicable) or capable of performance evaluation;

c) take into account:

- applicable requirements;
- the results of the assessment of risks and opportunities;
- the results of consultation with workers, and, where they exist, workers' representatives;
  - be monitored;
  - be communicated;
  - be updated as appropriate.

6.2.2 Planning to achieve OHS objectives

When planning how to achieve its OHS objectives, the organization shall determine:

- what will be done;
- what resources will be required;
- who will be responsible;
- when it will be completed;
- how the results will be evaluated, including indicators for monitoring;
- how the actions to achieve OHS objectives will be integrated into the organization's business processes.

The organization shall maintain and retain documented information on the OHS objectives and plans to achieve them.

Planning (Clause 6)

☑ Actions to address risks and opportunities
- General
- Hazard identification and assessment of risk and opportunities
  - Hazard identification
  - Assessment of OHS risks and other risks to the OHS MS
  - Assessment of OHS opportunities and other opportunities to the OHS MS
- Determination of legal requirements and other requirements
- Planning action

☑ OHS objectives and planning to achieve them
- OH&S objectives
- Planning to achieve OH&S objectives

Support (Clause 7)

☑Resources

☑Competence

☑Awareness

☑Communication

  – General

  – Internal communication

  – External communication

☑Documented information

  – General

  – Creating and updating

  – Control of documented information

7.1 Resources

The organization shall determine and provide the resources needed for the establishment, implementation, maintenance and continual improvement of the OHS MS.

7.2 Competence

The organization shall:

- determine the necessary competence of workers that affects or can affect its OHS performance;
- ensure that workers are competent (including the ability to identify hazards) on the basis of appropriate education, training or experience;
- where applicable, take actions to acquire and maintain the necessary competence, and evaluate the effectiveness of the actions taken;
- retain appropriate documented information as evidence of competence.

NOTE Applicable actions can include, for example, the provision of training to, the mentoring of, or the reassignment of currently employed persons, or the hiring or contracting of competent persons.

7.2 Awareness

Workers shall be made aware of:

- the OHS policy and OHS objectives;
- their contribution to the effectiveness of the OHS MS, including the benefits of improved OHS performance;
- the implications and potential consequences of not conforming to the OHS MS requirements;
- incidents and the outcomes of investigations that are relevant to them;
- hazards, OHS risks and actions determined that are relevant to them;
- the ability to remove themselves from work situations that they consider present an imminent and serious danger to their life or health, as well as the arrangements for protecting them from undue consequences for doing so.

7.4 Communication

The organization shall establish, implement and maintain the process(es) needed for the <u>internal</u> and <u>external</u> communications relevant to the OHS management system, including determining:

- on what it will communicate;
- when to communicate;
- with whom to communicate:
  - internally among the various levels and functions of the organization;
  - among contractors and visitors to the workplace;
  - among other interested parties;
- how to communicate

7.4.2 Internal communication

The organization shall:

- internally communicate information relevant to the OHS management system among the various levels and functions of the organization, including changes to the OHS management system, as appropriate;
- ensure its communication process(es) enables workers to contribute to continual improvement.

7.4.3 External communication

The organization shall externally communicate information relevant to the OHS management system, as established by the organization's communication process(es) and taking into account its legal requirements and other requirements.

7.5 Documented information

The organization's OHS MS shall include:

- documented information required by this document;
- documented information determined by the organization as being necessary for the effectiveness of the OHS MS;

NOTE The extent of documented information for an OH&S management system can differ from one organization to another due to:

- *the size of organization and its type of activities, processes, products and services;*
- *the need to demonstrate fulfilment of legal requirements and other requirements;*
- *the complexity of processes and their interactions;*
- *the competence of workers.*

7.5.2 Creating and updating

When creating and updating documented information the organization shall ensure appropriate:

- identification and description (e.g. a title, date, author or reference number);
- format (e.g. language, software version, graphics) and media (e.g. paper, electronic);
- review and approval for suitability and adequacy.

7.5.3 Control of documented information

Documented information required by the OHS MS and by this document shall be controlled to ensure:

- it is available and suitable for use, where and when it is needed;
- it is adequately protected (e.g. from loss of confidentiality, improper use or loss of integrity).

For the control of documented information, the organization shall address the following activities, as applicable:

- distribution, access, retrieval and use;
- storage and preservation, including preservation of legibility;
- control of changes (e.g. version control);
- retention and disposition.

7.5.3 Control of documented information

Documented information of external origin determined by the organization to be necessary for the planning and operation of the OH&S MS shall be identified, as appropriate, and controlled.

Support (Clause 7)

☑Resources

☑Competence

☑Awareness

☑Communication

- – General
- – Internal communication
- – External communication

☑Documented information

- – General
- – Creating and updating
- – Control of documented information

Operation (Clause 8)

☑ Operational planning and control
- General
- Eliminating hazards and reducing OHS risks
- Management of change
- Procurement
  - General
  - Contractors
  - Outsourcing

☑ Emergency preparedness and response

8.1 Operational planning and control

The organization shall plan, implement, control and maintain the processes needed to meet requirements of the OHS MS, and to implement the actions determined in Clause 6, by:

- establishing criteria for the processes;
- implementing control of the processes in accordance with the criteria;
- maintaining and retaining documented information to the extent necessary to have confidence that the processes have been carried out as planned;
- adapting work to workers.

At multi-employer workplaces, the organization shall coordinate the relevant parts of the OHS MS with the other organizations.

8.1.2 Eliminating hazards and reducing OHS risks

The organization shall establish, implement and maintain a process(es) for the elimination of hazards and reduction of OHS risks using the following "hierarchy of control":

- eliminate the hazard;
- substitute with less hazardous processes, operations, materials or equipment;
- use engineering controls and reorganization of work;
- use administrative controls, including training;
- use adequate personal protective equipment.

NOTE In many countries, legal requirements and other requirements include the requirement that personal protective equipment (PPE) is provided at no cost to workers.

8.1.2 Eliminating hazards and reducing OHS risks

HIERARCHY OF CONTROLS

Most Effective

ELIMINATION — Physically remove the hazard

SUBSTITUTION — Replace the hazard

ENGINEERING CONTROLS — Isolate people from the hazard

ADMINISTRATIVE CONTROLS — Change the way people work

PPE — Protect the worker with Personal Protective Equiptment

Least Effective
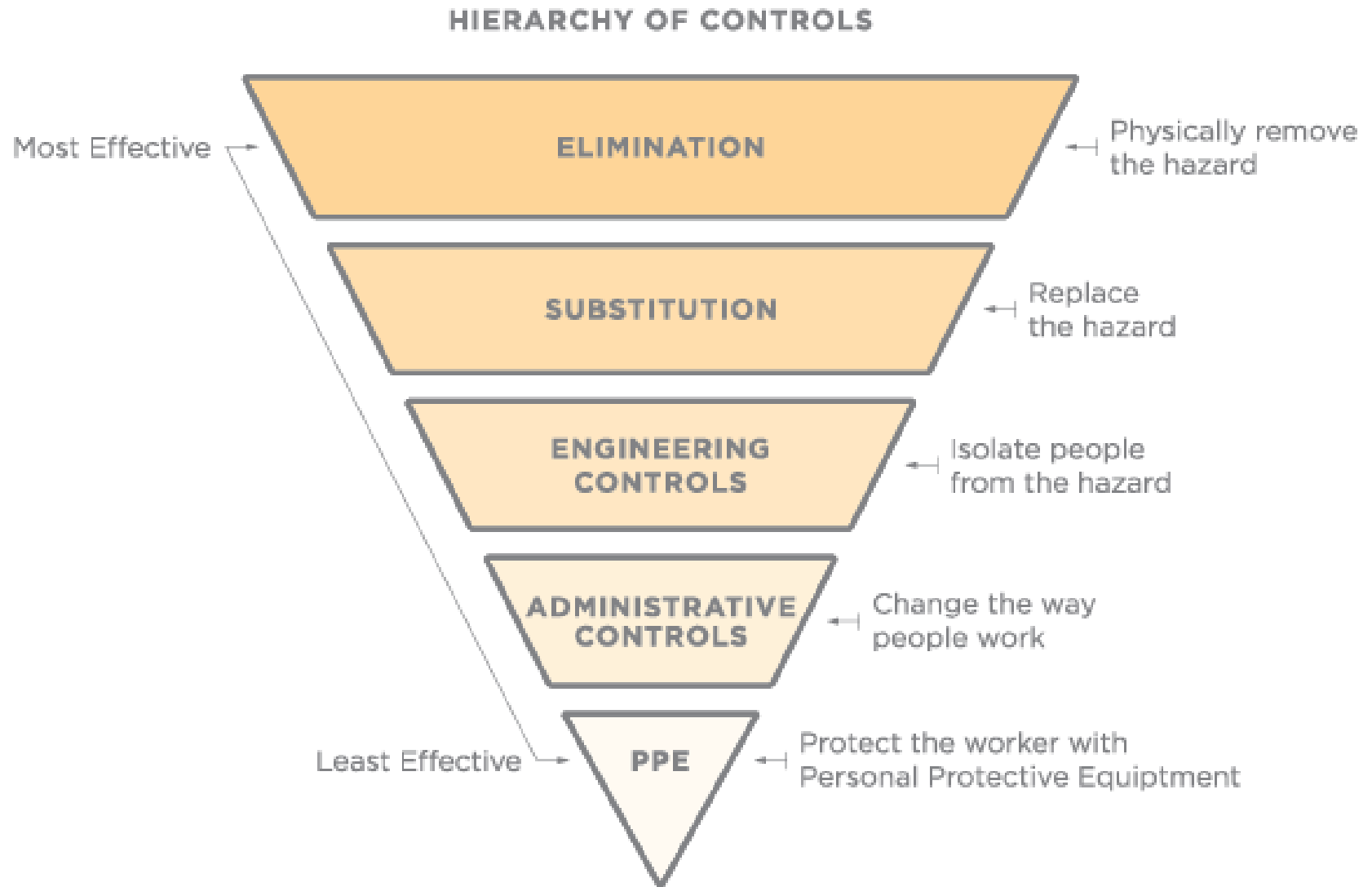
Hierarchy of control

<u>Noise hazard (from piling activity)</u>

Elimination	▸ Eliminate the process (use pad footing / raft footing)
Substitution	▸ Substitute process with less noise (micro pile / bore pile/ injection)
Engineering controls	▸ Isolate the noise (use of silencer)
Admin controls	▸ Signage's, warning, procedures
PPE	▸ Ear plug, ear muff

Hierarchy of control

Working at night

Elimination	▸ Eliminate the process (No working at night)
Substitution	▸ Substitute (fully automated)
Engineering controls	▸ Use flood light
Admin controls	▸ All the workers trained to work night work / Work on shift
PPE	▸ Use head light / reflector
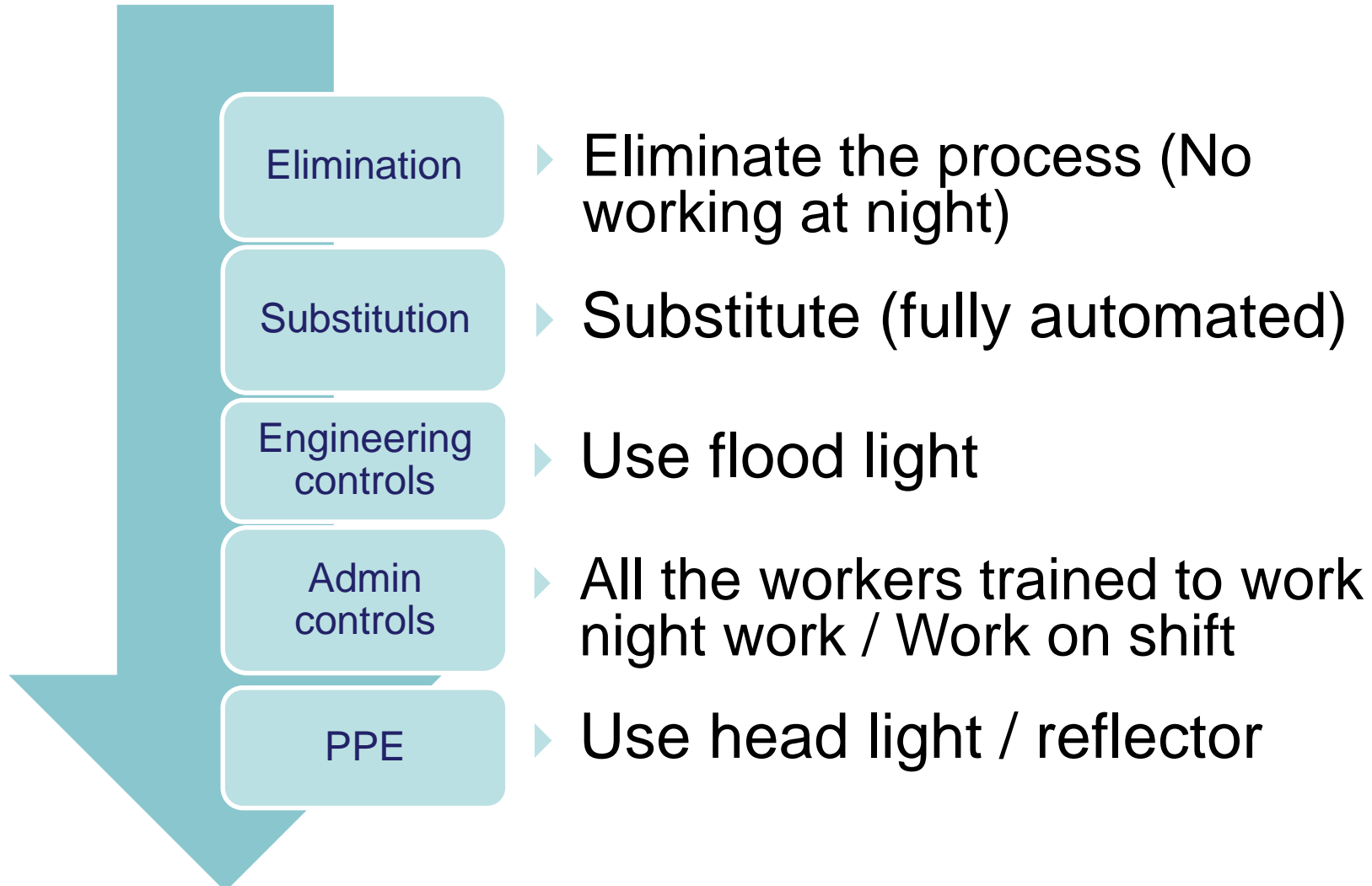
Hierarchy of control

Riding motorbike to work

Elimination	▸ Don't go to work / Change job
Substitution	▸ Use Public transport / car
Engineering controls	▸ Modify the motorbike to be safe/ put shield / warning lights / extra wheel
Admin controls	▸ Get proper training on how to ride motorbike. Use motorbike lane. Go early to work, come back late.
PPE	▸ Use helmet / wear jacket
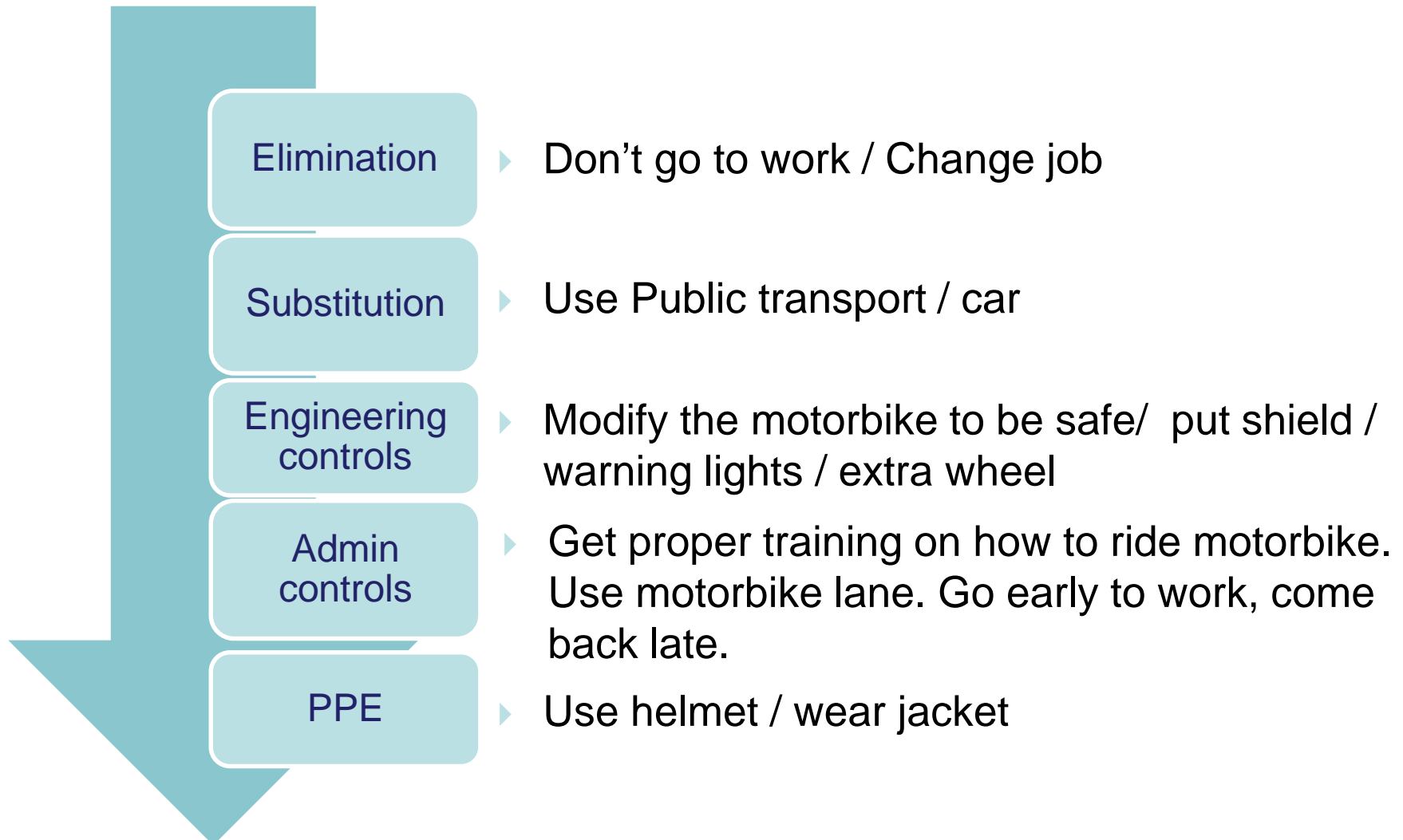
8.1.3 Management of change

The organization shall establish a process(es) for the implementation and control of planned temporary and permanent changes that impact OHS performance, including:

- new products, services and processes, or changes to existing products, services and processes, including:
  - workplace locations and surroundings;
  - work organization;
  - working conditions;
  - equipment;
  - work force;
- changes to legal requirements and other requirements;

8.1.3 Management of change

(contd):

- changes in knowledge or information about hazards and OHS risks;
- developments in knowledge and technology.

The organization shall review the consequences of <u>unintended</u> changes, taking action to mitigate any adverse effects, as necessary.

NOTE: Changes can result in risks and opportunities.

8.1.4 Procurement - Contractors

The organization shall coordinate its procurement process(es) with its contractors, to identify hazards and to assess and control the OHS risks, arising from the:

- contractors' activities and operations that impact the organization;
- organization's activities and operations that impact the contractors' workers;
- contractors' activities and operations that impact other interested parties in the workplace.

The organization shall ensure that the requirements of its OHS MS are met by contractors and their workers. The organization's procurement process(es) shall define and apply OHS criteria for the selection of contractors.

- *NOTE It can be helpful to include the occupational health and safety criteria for the selection of contractors in the contractual documents*

8.1.4.3 Outsourcing

The organization shall ensure that outsourced functions and processes are controlled.

The organization shall ensure that its outsourcing arrangements are consistent with legal requirements and other requirements and with achieving the intended outcomes of the OHS management system.

The type and degree of control to be applied to these functions and processes shall be defined within the OHS management system.

NOTE Coordination with external providers can assist an organization to address any impact outsourcing has on its OH&S performance.

8.2 Emergency preparedness and response

The organization shall establish, implement and maintain a process(es) needed to prepare for and respond to potential emergency situations, as identified in 6.1.2.1, including:

- establishing a planned response to emergency situations, including the provision of first aid;

- providing training for the planned response;

- periodically testing and exercising the planned response capability;

- evaluating performance and, as necessary, revising the planned response, including after testing and in particular after the occurrence of emergency situations;

- communicating and providing relevant information to all workers on their duties and responsibilities;

8.2 Emergency preparedness and response

(contd):

- communicating relevant information to contractors, visitors, emergency response services, government authorities and, as appropriate, the local community;

- taking into account the needs and capabilities of all relevant interested parties and ensuring their involvement, as appropriate, in the development of the planned response.

The organization shall maintain and retain documented information on the process(es) and on the plans for responding to potential emergency situations.

Operation (Clause 8)

☑ Operational planning and control

- General
- Eliminating hazards and reducing OH&S risks
- Management of change
- Procurement
  - General
  - Contractors
  - Outsourcing

☑ Emergency preparedness and response

Performance evaluation (Clause 9)

☑Monitoring, measurement, analysis and performance evaluation
- General
- Evaluation of compliance

☑Internal audit
- General
- Internal audit programme

☑Management review

9.1 Monitoring, management, analysis and performance evaluation

The organization shall establish, implement and maintain a process(es) for monitoring, measurement, analysis and performance evaluation.

The organization shall determine:

- what needs to be monitored and measured, including:
  - the extent to which legal requirements and other requirements are fulfilled;
  - its activities and operations related to identified hazards, risks and opportunities;
  - progress towards achievement of the organization's OHS objectives;
  - effectiveness of operational and other controls;

9.1 Monitoring, management, analysis and performance evaluation

The organization shall determine (contd):

- the methods for monitoring, measurement, analysis and performance evaluation, as applicable, to ensure valid results;

- the criteria against which the organization will evaluate its OHS performance;

- when the monitoring and measuring shall be performed;

- when the results from monitoring and measurement shall be analysed, evaluated and communicated.

9.1 Monitoring, management, analysis and performance evaluation

The organization shall ensure that monitoring and measuring equipment is calibrated or verified as applicable, and is used and maintained as appropriate.

NOTE There can be legal requirements or other requirements (e.g. national or international standards) concerning the calibration or verification of monitoring and measuring equipment.

The organization shall retain appropriate documented information:

• as evidence of the results of monitoring, measurement, analysis and performance evaluation;

• on the maintenance, calibration or verification of measuring equipment.

ESH Management Program - Site.doc

ESH Management Program - Office.doc

9.1.2 Evaluation of compliance

The organization shall establish, implement and maintain a process(es) for evaluating compliance with legal requirements and other requirements.

The organization shall:

- determine the frequency and method(s) for the evaluation of compliance;
- evaluate compliance and take action if needed;
- maintain knowledge and understanding of its compliance status with legal requirements and other requirements;
- retain documented information of the compliance evaluation result(s).
- Evaluationof Compliance.docx

9.2 Internal audit

The organization shall conduct internal audits at planned intervals to provide information on whether the OHS MS:

- conforms to:
  - the organization's own requirements for its OHS MS, including the OHS policy and OH&S objectives;
  - the requirements of this document;
- is effectively implemented and maintained.

9.2 Internal audit

The organization, shall:

- plan, establish, implement and maintain an audit programme(s) including the frequency, methods, responsibilities, consultation, planning requirements and reporting, which shall take into consideration the importance of the processes concerned and the results of previous audits;
- define the audit criteria and scope for each audit;
- select auditors and conduct audits to ensure objectivity and the impartiality of the audit process;

9.2 Internal audit

(contd):

- ensure that the results of the audits are reported to relevant managers; ensure that relevant audit results are reported to workers, and, where they exist, workers' representatives, and other relevant interested parties;

- take action to address nonconformities and continually improve its OH&S performance ;

- retain documented information as evidence of the implementation of the audit programme and the audit results.

NOTE For more information on auditing and the competence of auditors, see ISO 19011.

9.3 Management review

Top management shall review the organization's OH&S management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness.

9.3 Management review

The management review shall include consideration of:

- the status of actions from previous management reviews;
- changes in external and internal issues that are relevant to the OH&S MS including:
  - the needs and expectations of interested parties;
  - legal requirements and other requirements;
  - risks and opportunities;
- the extent to which the OH&S policy and the OH&S objectives have been met;

9.3 Management review

The management review shall include consideration of (contd):

- information on the OHS performance, including trends in:
  - incidents, nonconformities, corrective actions and continual improvement;
  - monitoring and measurement results;
  - results of evaluation of compliance with legal requirements and other requirements;
  - audit results;
  - consultation and participation of workers;
  - risks and opportunities;
- adequacy of resources for maintaining an effective OHS MS;
- relevant communication(s) with interested parties;
- opportunities for continual improvement.

9.3 Management review

The outputs of the management review shall include decisions related to:

- continuing suitability, adequacy and effectiveness of the OHS MS in achieving its intended outcomes;
- continual improvement opportunities;
- any need for changes to the OHS MS;
- resources needed;
- actions if needed;
- opportunities to improve integration of the OHS MS with other business processes;
- any implications for the strategic direction of the organization.

9.3 Management review

Top management shall communicate the relevant outputs of management reviews to workers, and, where they exist, workers' representatives.

The organization shall retain documented information as evidence of the results of management reviews.
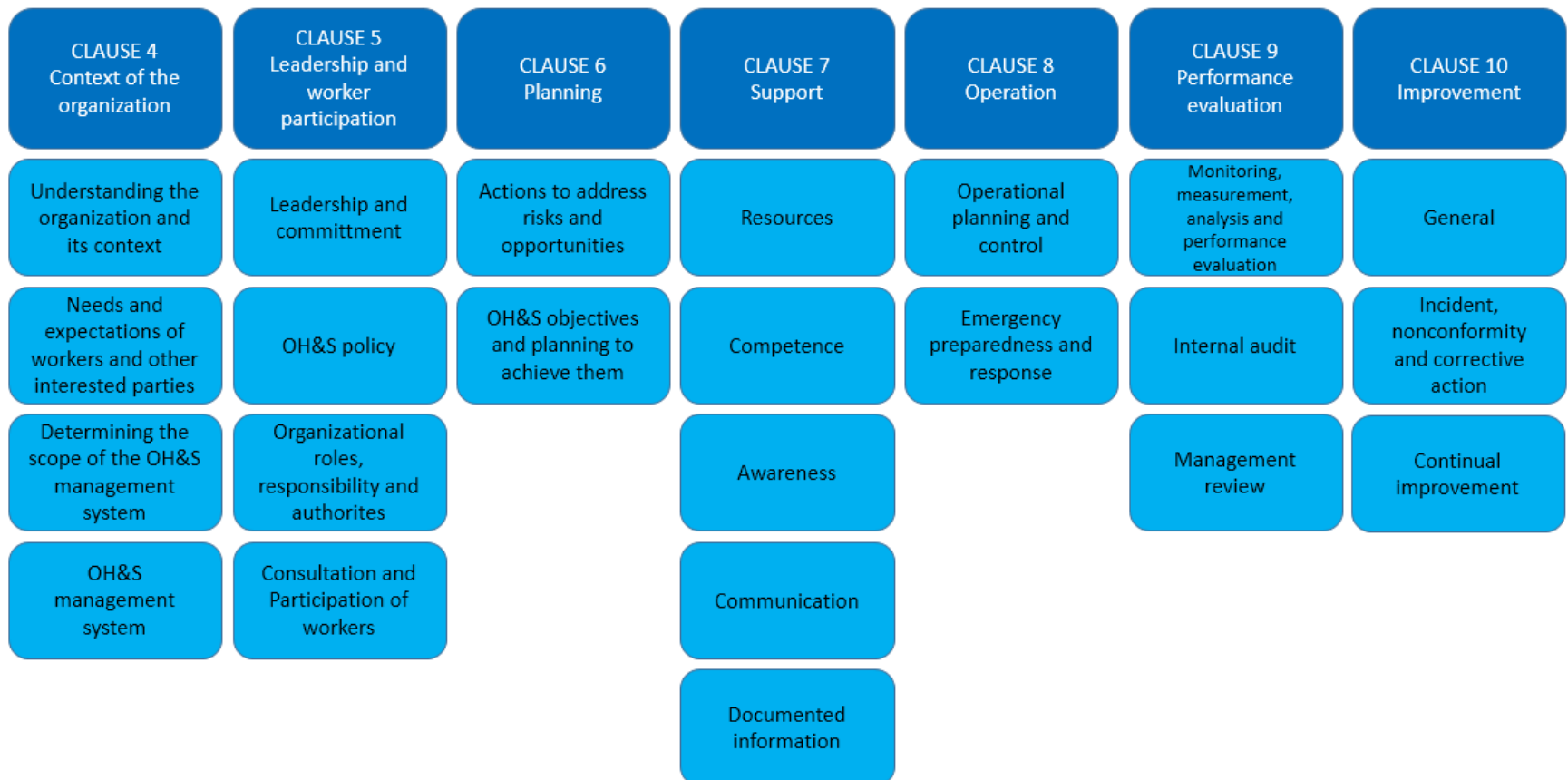
Performance evaluation (Clause 9)

☑ Monitoring, measurement, analysis and performance evaluation
  – General
  – Evaluation of compliance
☑ Internal audit
  – General
  – Internal audit programme
☑ Management review

Improvement (Clause 10)

☑ General

☑ Incident, nonconformity and corrective action

☑ Continual improvement

ISO 45001 - REQUIREMENTS

CLAUSE 4 Context of the organization	CLAUSE 5 Leadership and worker participation	CLAUSE 6 Planning	CLAUSE 7 Support	CLAUSE 8 Operation	CLAUSE 9 Performance evaluation	CLAUSE 10 Improvement
Understanding the organization and its context	Leadership and committment	Actions to address risks and opportunities	Resources	Operational planning and control	Monitoring, measurement, analysis and performance evaluation	General
Needs and expectations of workers and other interested parties	OH&S policy	OH&S objectives and planning to achieve them	Competence	Emergency preparedness and response	Internal audit	Incident, nonconformity and corrective action
Determining the scope of the OH&S management system	Organizational roles, responsibility and authorites		Awareness		Management review	Continual improvement
OH&S management system	Consultation and Participation of workers		Communication			
			Documented information			

10. Improvement

The organization shall determine opportunities for improvement and implement necessary actions to achieve the intended outcomes of its OHS MS.

Continual Process Improvement

10. Improvement

- The organization should consider
  - results from analysis and evaluation of OHS performance
  - evaluation of compliance
  - internal audits
  - management review

  when taking action to improve.
- include corrective action, continual improvement, breakthrough change, innovation and reorganization.

10.2 Incident, nonconformity and corrective action

The organization shall establish, implement and maintain a process(es), including reporting, investigating and taking action, to determine and manage incidents and nonconformities.

INCIDENT
INVESTIGATION

10.2 Incident, nonconformity and corrective action

When an incident or a nonconformity occurs, the organization shall:

- react in a timely manner to the incident or nonconformity and, as applicable:
  - take action to control and correct it;
  - deal with the consequences;
- evaluate, with the participation of workers and the involvement of other relevant interested parties, the need for corrective action to eliminate the root cause(s) of the incident or nonconformity, in order that it does not recur or occur elsewhere, by:
  - investigating the incident or reviewing the nonconformity;
  - determining the cause(s) of the incident or nonconformity;
  - determining if similar incidents have occurred, nonconformities exist, or if they could potentially occur;

10.2 Incident, nonconformity and corrective action

(cont):

- review existing assessments of OHS risks and other risks, as appropriate;
- determine and implement any action needed, including corrective action, in accordance with the hierarchy of controls and the management of change;
- assess OHS risks that relate to new or changed hazards, prior to taking action;
- review the effectiveness of any action taken, including corrective action;
- make changes to the OHS MS, if necessary. Corrective actions shall be appropriate to the effects or potential effects of the incidents or nonconformities encountered.

10.2 Incident, nonconformity and corrective action

The organization shall retain documented information as evidence of:

- the nature of the incidents or nonconformities and any subsequent actions taken;

- the results of any action and corrective action, including their effectiveness.

The organization shall communicate this documented information to relevant workers, and, where they exist, workers' representatives, and other relevant interested parties.

NOTE The reporting and investigation of incidents without undue delay can enable hazards to be eliminated and associated OH&S risks to be minimized as soon as possible.

10.2 Incident, nonconformity and corrective action

- Root cause analysis - practice of exploring all the possible factors associated with an incident or nonconformity by asking what happened, how it happened and why it happened, to provide the input for what can be done to prevent it from happening again.

- should use methods appropriate to the nature of the incident or nonconformity. The focus is prevention.

- identify multiple contributory failures, including factors related to communication, competence, fatigue, equipment or procedures.

- Reviewing the effectiveness of corrective actions [see 10.2 f)] refers to the extent to which the implemented corrective actions adequately control the root cause(s).

10.3 Continual improvement

The organization shall continually improve the suitability, adequacy and effectiveness of the OHS MS, by:

- enhancing OHS performance;
- promoting a culture that supports an OHS MS;
- promoting the participation of workers in implementing actions for the continual improvement of the OHS MS;
- communicating the relevant results of continual improvement to workers, and, where they exist, workers' representatives;
- maintaining and retaining documented information as evidence of continual improvement.

10.3 Continual improvement

Examples of continual improvement:

- new technology;
- good practices, both internal and external to the organization;
- suggestions and recommendations from interested parties;
- new knowledge and understanding of occupational health and safety-related issues;
- new or improved materials;
- changes in worker capabilities or competence;
- achieving improved performance with fewer resources (i.e. simplification, streamlining, etc.).

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-