UTM OPENCOURSEWARE

CONSTRUCTION SAFETY: 9

SAFETY MANAGEMENT- IMPLEMENTATION, AUDIT & REVIEW

SBC 3363

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Contents

1. Organisation structure and roles
2. Implementation of safety management, audit and review
3. Monitoring
4. OSH policy-important & development
5. Safety trainning programme
6. Performance measurement and monitoring

Safety factors at organisation level

Safety factors at project level
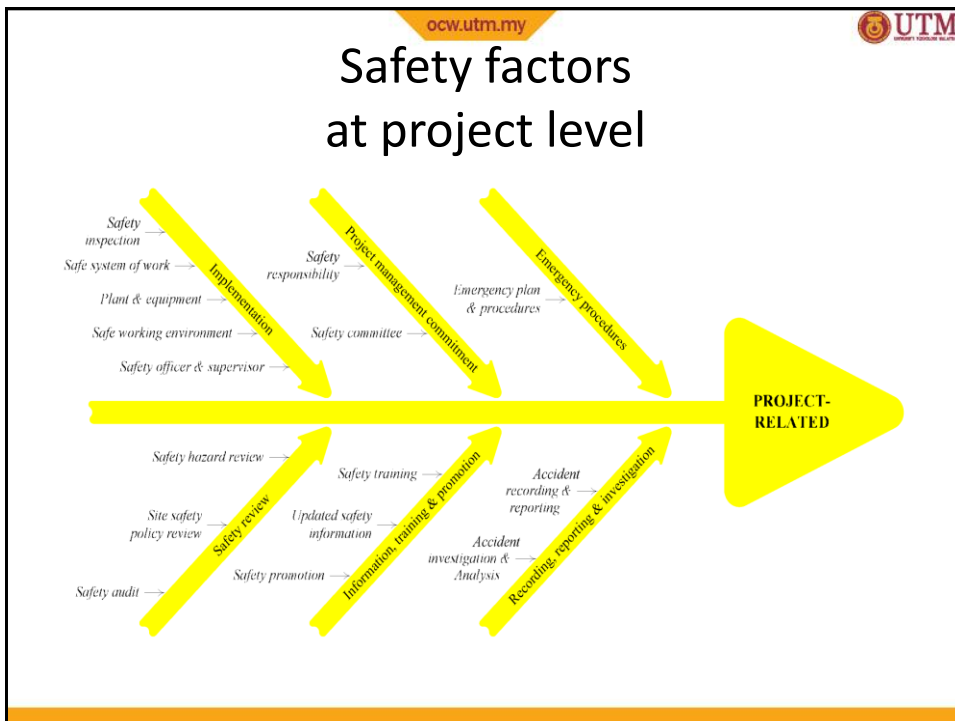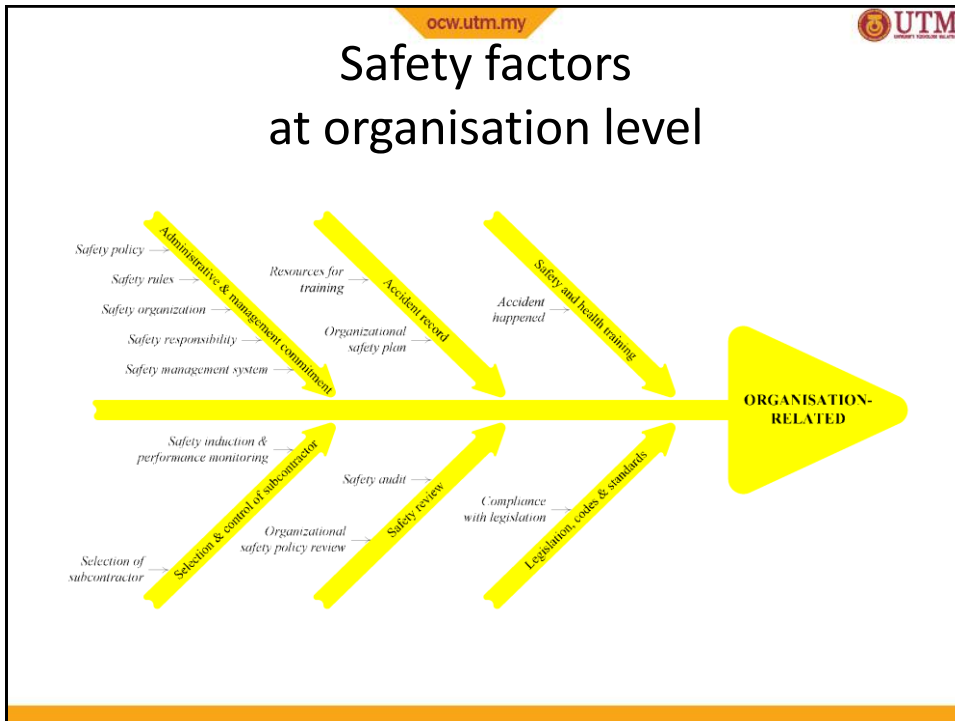
Creating OSH Policy, Organisation And Arrangements

- OSHA 1994 requires to have written policy, organisation and arrangements
- Purpose of OSH programme is to ensure:
  - **Implementing the goals** of OSH policy
  - **Minimum compliance** with national laws and regulations
  - **Good operation** of the organisation's OSH management system
  - **Continual improvement** in OSH performance

Planning An OSH Programme

- Begin with:
  1. **Goals** of the organisation written in the policy
  2. **Legal** and other requirements
  3. Identified **hazard and risks**
- **Prioritise** the needs of these requirements and set objectives and target for the organisation to achieve
- **Set objectives and targets**
- Create **action plans** with **datelines and responsibilities for completion**

Safety & Health Management

Strategi:

- Menubuhkan Jawatankuasa Keselamatan dan Kesihatan
- Mengenal pasti hazard di tempat kerja
- Menaksir risiko
- Merancang dan mengatur langkah-langkah keselamatan dan kesihatan

Action Plan For Legal And Other Obligations

1. Identify **legal requirements**:
   - ✓ Identify which regulation applies e.g.
     – SHO Regulations 1997, SHC Regulations 1996, CIMAH Regulations 1996, USECHH Regulations 2000

     – Codes of practice or guidelines

- Identify other requirements e.g.
  - ✓ e.g. "Responsible Care"
- ✓ Implement all above requirements

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Action Plan For
OSH Arrangements

- Get **management commitment**

- Design plans based on **objectives and targets**

- Arrange for **resources** (human, financial and technical support)

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Action Plan For
OSH Arrangements

- Identify how to measure success of the programme (**performance indicators**)

- Assign **responsibilities** for each programme

- **Communicate** these requirements to managers and supervisors concerned

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Responsibilities for the Implementation of OSH Programmes

- General responsibility
  - **<u>Top Management</u>**
    - **<u>Overall responsibility</u>**
    - Provide resources to implement the policy

  - **<u>Line Management and Supervisors</u>**
    - **<u>Day-to-day</u>** programme tasks and responsibilities

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Responsibilities for the Implementation of OSH Programmes

  - **<u>Employee</u>**
    - To **<u>cooperate</u>**
    - Obey rules and regulations
    - Reporting
    - Involvement in consultations

Responsibilities for the Implementation of OSH Programmes

- **Line Management Responsibilities**
  – Ensuring that OSH is managed within their area of operations
    - Include arrangements to resolve any conflict between OSH issues and productivity by escalation to higher management.

Responsibilities for the Implementation of OSH Programmes

- Specific responsibilities (preferably written in their job descriptions):
  – Those managing contractors
  – Those responsible for OSH training
  – Those responsible for plant and equipment
  – OSH specialists: industrial hygiene, investigators & auditors, SHO, etc.

OSH Programmes

- **Information, instruction, training**:
  – OSH promotion
  – Awareness programme
  – Training / induction and other training
  – Signs and labels
  – Tool box meeting
  – Communicating and consultation

OSH Programmes

- The provision of **systems of work**:
  – Procedures, training and supervision
    - Include procedures for contractors and visitors

  – First Aid

  – Emergency preparedness
    - Including evacuation drill and emergency exercises

OSH Programmes

- **Arrangements** for use or operation, handling, storage and transport of plant and substances:
  - Assessment
  - Hazard / accident reporting
  - PPE
  - Showers

OSH Programmes

- Provision of **facilities for welfare of employees**:
  - Cafeteria
  - Showers
  - Toilets

OSH Programmes

- Implementing **Risk Control**:
  - Prioritises **risk reduction programme** according to the hierarchy of control
  - Establish "**System Of Work**" if administrative control measures are required
  - **Inform and train** affected employees before Implementation of control measures
  - Information and training is important especially when there is a "decision to change"

Safe System of Work

- A formal procedure to minimise remaining risks

  EXAMPLES WHERE REQUIRED, IN PARTICULAR,

  - Cleaning and maintenance operations,
  - Working alone.
  - Breakdowns.
  - Emergencies.

- Should have **safe working procedures** for all jobs.

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Safe System of Work

- Implementing
  - Identify required **safe working procedure**.
  - Write **safe work instructions**
  - Provide **training**
  - Ensure **supervision**
  - **Monitor** effectiveness of control measures and act accordingly

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Safe System of Work
Permit-To-Work Required

- Electrical work, especially at higher voltages
- Entry into confined spaces e.g. vessels
- Excavation work or demolition activities
- Presence or possible release of
  - Ionising radiation, or flammable gases, liquid or dusts (possible risk of ignition by hot work, electrical or electrostatic sources)
- Lone working in hazardous environments

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Safe System of Work
Permit-To-Work

- Documentation:
  - Written authority, e.g. to carry out maintenance in a confined space
  - Issued by authorised person
  - States job risk has been assessed
  - Details safety precautions
  - Authorises the work
  - Permanent record of precautions taken

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Safe System of Work
Permit-To-Work

- Training and supervision very important
- Audit

Safe System of Work – Lone Working

- May include the "Buddy System":
    - (a) Challenge-check system. (e.g. aircraft checklists)
    - (b) Lifeguard system. (e.g. jobs requiring lifelines and special protective gear)
    - (c) Two-person system. (e.g. in electrical substation operations)

The Importance Of Human Factors

- Human factors can lead to accidents:
    - General health and fitness
    - Complacency
    - Fatigue, Boredom
    - Rushing (cutting corners)
    - Panic in emergencies
    - Over eagerness (not following procedures)
    - Inter-group relationships
- Build in fail-safe mechanism or remove the risk

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Material Safety Data Sheets (MSDS)

- Preparation of Material Safety Data Sheets is part of comprehensive safety program
- OSHA standard 1910.1200 provides need for hazard communications at the workplace:
    - "*Purpose*: The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training."
- Material Safety Data Sheets (MSDS) are created for any material at the workplace that could be hazardous to employers or employees:
    - Toxins, poisons, explosives, carcinogen, irritants, etc.
- MSDS provides description and chemical properties of hazard:
    - Information on supplier – address and telephone number
    - What to do in an emergency
- MSDS must be made available to employees who are working at the site.

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Definition of Audit

- An OSH audit is a systematic examination to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable for achieving the organization's policy and objectives.

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Auditing Is a Management Tool

- Originally applied to finance and accounting to instil shareholder confidence
- It evaluates:
  - Are procedures in place, Are people aware of them, Are they being followed, Are they adequate? Are there anybody accountable?
  - How well the management system is functioning
- OSH auditing is important for the same reason

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Auditing Versus Inspection

- Audits are for **organisations** (not on individuals) (long-term plans)
  - Evaluating companywide health and safety controls and management system
- Inspection are for **things** (short - medium-term)
  - Identifying equipment or condition in a workplace for corrective and preventive action
- Investigation are for **situations** (ad hoc)
  - Inquire into a situation or problem in order to discover the root cause e.g. of an accident

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Inspection Sets Standards On Hardware Aspects

- Health:
    - Drainage, lighting, ventilation; cleanliness and overcrowding
- Safety:
    - Guarding, hoists, lifts; ropes, cranes, access, floors, stairs; fire prevention means of escape
- Welfare:
    - Washing facilities, accommodation and first-aid
- An inspection will produce an action list rather than an audit assessment sheet

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Inspection Is Part Of Auditing

Auditing And Investigation

Interviewing

Observation

Reviewing

Inspection

Sampling

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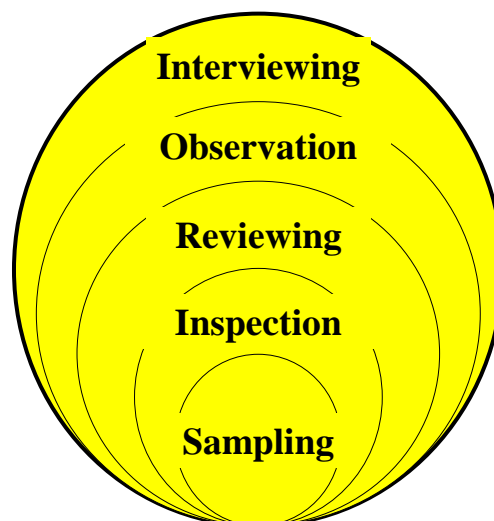
Types of Audits

First party: Auditing own organization (internal audit)

Second party: Auditing a contractor, supplier, etc.

Third party: Independent consultant or Certifier audits of an organization

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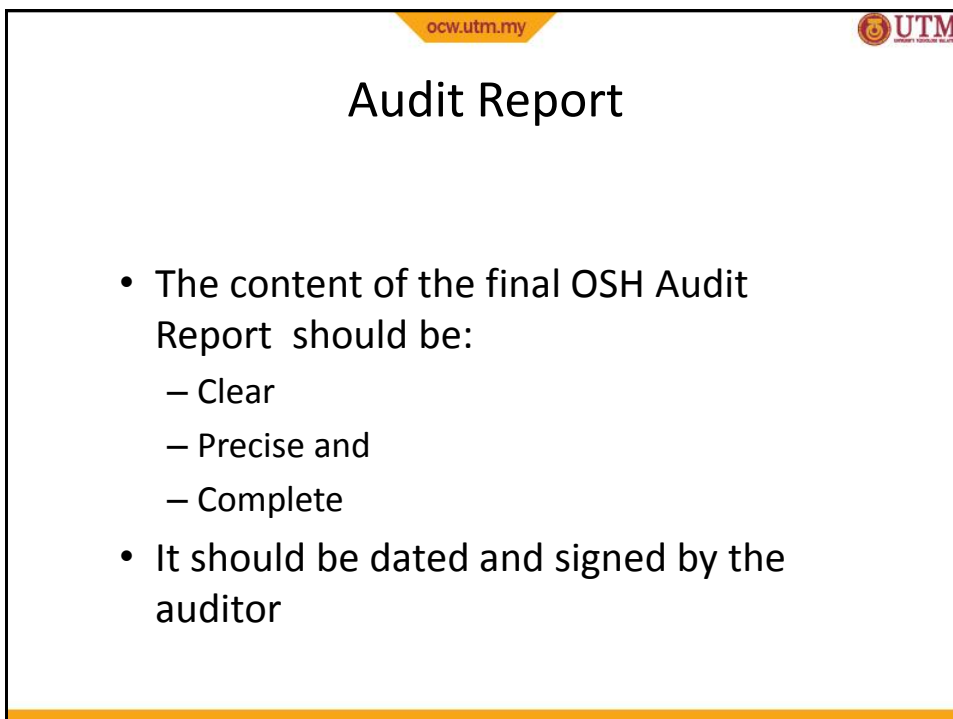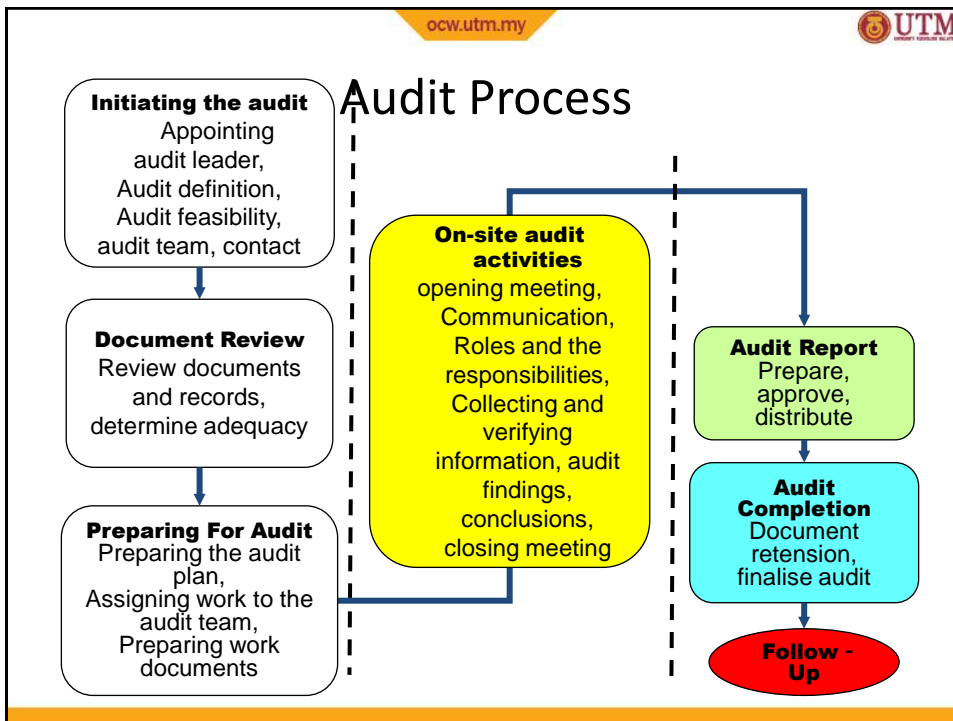# Audit Effectiveness Depends on Management Support

- Management authorise
  - An audit policy and programme
    - Responsibility, competent auditors, the audit scope, the frequency of audits, audit schedule, audit methodology and reporting
  - Periodic audits to determine if OSH-MS are in place, adequate, and effective
- Review results of previous audits

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Determining Frequency Of Audit

- Dependent on the objectives of the audit
  - E.g. Compliance
- Nature of workplace:
  - Degree of risk
  - Management program maturity
  - Results of prior audits
  - Incident history
  - Company policies
  - Output from management reviews

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Principles of Auditing

1. Each audit must have its objective, criteria and scope (activities and areas)
2. Objectivity (only by independent and competent auditors)
3. Professional and ethical conduct of the audit (systematic, documented and findings are based on verified evidence and predetermined audit criteria)
4. Thoroughness of work to ensure fair presentation of audit findings and conclusions
5. Must end with a written audit report

Audit Process

Initiating the audit
Appointing audit leader, Audit definition, Audit feasibility, audit team, contact

Document Review
Review documents and records, determine adequacy

Preparing For Audit
Preparing the audit plan, Assigning work to the audit team, Preparing work documents

On-site audit activities
opening meeting, Communication, Roles and the responsibilities, Collecting and verifying information, audit findings, conclusions, closing meeting

Audit Report
Prepare, approve, distribute

Audit Completion
Document retension, finalise audit

Follow - Up

Audit Report

- The content of the final OSH Audit Report should be:
  - Clear
  - Precise and
  - Complete
- It should be dated and signed by the auditor

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Internal Audit

- Conduct audit at planned interval to:
  - determine whether or not the HSE MS conform to planned arrangement for environmental management including the requirements of the standard
  - has been properly implemented and maintained
- Provide information on the results of the audits management
- Audit program (s) shall be established, implemented & maintained
- Procedures shall be established, implemented & maintained to address:
  - Responsibilities & requirements for planning, conducting, reporting and retaining audit records
  - Audit criteria, scope, frequency & methods
- Auditors shall be objective and impartial

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Contents Of Audit Report

1. Audit objectives and scope
2. Audit plan
3. Identification of the auditing team
4. Audited representatives
5. Dates of audit
6. Identification of the areas subject to audit
7. The identification of reference documents used)
8. Details of identified non-conformances
9. Assessment of conformity with standards or guidelines
10. The ability of the OSH-Ms to achieve its objectives
11. Distribution of audit report

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What Is A
Management Review

- Management review is a process of **reviewing the organisations management system, programmes and performance by top management**

- Carried out by a Management Review Committee made up of managers, SHO, OSH specialist advisors and others

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Purpose Of A Management Review

- To ensure that the organisation **complies with its own safety and health policy and objectives**

- It helps in making decision on **necessary corrections or improvements**

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What Is Involved In The Process

- Reviewing, evaluating or deciding on:
  - **Performance**
  - **Implementation of policy and objectives**
  - Necessary changes to policy, objectives, procedures, system of work , etc.
  - Accommodating **changes** in regulation, technology, standards or expectations
  - **Action plans** for corrective action or continual improvements

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What To Review And Evaluate

- **Statistics and trends** of accident, near-misses, dangerous occurrence, poisoning or disease

- Results of **internal/external audits/investigation**

- **Corrective actions** carried out

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What To Review And Evaluate

- **Reports of emergencies** (actual/exercises)

- **Organisational changes and plant modifications**

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What To Review And Evaluate

- Reports of **hazard identification, risk assessment and risk control processes**

- Report on the **overall performance** of the management system; managers reports

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Management Review

❖ Review at planned intervals
❖ Record shall be retained and include decisions & actions to elements of EMS
❖ Input shall include:
  ❖ Results of internal audits
  ❖ Evaluations of compliance to legal & other requirements
  ❖ External communications including complaints
  ❖ Status of objectives & targets
  ❖ Status of corrective & preventive actions
  ❖ Follow up actions from previous review
  ❖ Changing circumstances including development in legislations
  ❖ Recommendations for improvements

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Management Review

❖ Outputs shall include:
  ❖ Any decisions and actions related to changes to :
    ❖ Policy
    ❖ Objective & target
    ❖ Other elements of the EMS
  ❖ Consistent with the commitment to continual improvements

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Why You Must Carry Out a Management Review

- Required by SHC Regulations 1996, CIMAH Regulations 1996, etc.
- Plan, Do, Check and Act concept used in many management system standards:
  - MS1722:2003
  - OHSAS 18001 Occupational Health & Safety Management System standard
  - ISO 14001 EMS, ISO 9001 QMS

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Preparing for a Meeting

- Ensure the necessary information is collected
- Relevant personnel prepare documents, reports and analysis for the meeting
- Documents should be collated by the secretary (SHO) of the committee

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Preparing for a Meeting

- Consideration should be given to the following:
  - The **topics** to be addressed (agenda)
  - Who should attend (managers, SHO, OSH specialist advisors, other personnel)
  - Individual participants responsible for subjects of the review
  - Information to be brought to the review

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Safety and Health Committee Functions

- To assist in the development of programmes and safe systems of work
- Review effectiveness of programmes
- Inspect workplace
- Report unsafe conditions and unsafe acts
- Recommend corrective actions
- Investigate, any accident, dangerous occurrence, poisoning or disease

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Frequency of Review

- Depends on **organization's needs and conditions**.

- Safety And Health Committee Regulations 1996:
  - **Once every three months** minimum; but not necessarily review all items at every meeting

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Frequency of Review

- High risk situations, changing nature of hazards with time, and plant complexity require more frequent reviews.

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Management Review Meetings Must Be Documented

- **<u>Minutes</u>** of the review

- Revisions to the **<u>OSH policy and objectives</u>**

- Specific **<u>corrective actions</u>** for individual managers, with target dates for completion

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Management Review Meetings Must Be Documented

- Specific **<u>improvement actions</u>**, with assigned responsibility and target dates for completion

- **<u>Date</u>** for review of corrective action

- Emphasis all the above in future internal OSH management system audits

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Management Review Communication

- Observations, conclusions and recommendations should be **recorded** and **formally communicated** for appropriate action to:
    - The persons responsible for specific tasks;
    - The safety and health committee   (if management review committee is different from the SHC);
    - Workers and their representatives

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Continual Improvement

- Purpose of the Management Review Committee is also for **continual implement**.

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Continual Improvement

- Continual improvement should take into account:
  - **OSH objectives** of the organization
  - Outcomes of the **management review**
  - The **recommendations** from SHC and members of the organisation
  - Results of **performance monitoring**
  - **Investigation and audits**

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ISO 14001 and OHSAS 18001 MODEL

Continual Improvement

Management Review

OH&S Policy

Checking and Corrective Action
- Performance measurement & monitoring
- Accidents, incidents, non-conformance, corrective and preventive action
- Records & records management
- Audit

Planning
- Planning for Hazard Identification, Risk Assessment, Risk Control
- Legal & other requirements
- Objectives
- OH&S management program

Implementation & Operation
- Structure and Responsibility
- Training awareness and competence
- Consultation & Communication
- Documentation & Document Control
- Operational Control
- Emergency preparedness and response

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Control Of Records And Records Management

▸ Legible, identifiable and traceable to the activities
  (operations, safety, health, environment)
▸ Readily retrievable
▸ Retention times established
▸ Examples:
   - Safety Inspections
   - Audit Report
   - Accident Reports
   - Safety meeting minutes
   - Medical tests
   - Health surveillance
   - PPE issuance and PPE maintenance
   - Drills
   - Risk assessments
   - Training records
   - equipment PM, BM and testing
   - contract agreement

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SWOT ANALYSIS

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Construction Safety Management

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Elements of A Safety Program

Safety Program Development

- Assignment of responsibility
- Hazard identification and control
- Training and communication
- Documentation and enforcement of safety rules

Safety Program

- Maintenance of safe working conditions
- Setting performance goals
- Rewarding safety performance
- Reviewing circumstances involved in incidents
  - Taking appropriate correction actions

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Safety Program (cont'd)

- Establishing Safety performance objectives for all levels of management
- Including safety as part of management performance reviews
- Measuring effectiveness

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Changed the Goal Setting Process

- Previous goal setting process was arbitrary
  - The more accidents an operation had, the lower the goal for the following year

- A new goal was set, the same for all – ZERO
- This changed the the way everyone thought about safety and required a new approach

ZAP
Zero Accident Program

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Benefits of a Safety Program

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Benefits

- Reduced workers' compensation claims
- Reduced expenses related to injuries and illnesses
- Reduced absenteeism
- Lower employee complaints

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Benefits (cont'd)

- Improved employee morale and satisfaction
- Increased productivity
- Reduction of hidden cost
- Reduced insurance cost

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Consequences

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Hidden Cost

- Workers Compensation Cost
- Replacement and training cost for new or substitute employee
- Poor Quality
- Penalties for non-compliance

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Establishing Project-Specific Activities

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Planning a Project

- Develop goals and objectives
- Define project team
  - Project Manager
  - Site Supervisor
  - Site Safety
- Other Programs

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Roles and Responsibilities

- Supervisors/Management
  - Establish safe work practices
  - Enforce safety rules and regulations
  - Train employees how to avoid hazards
  - Enforce reporting work-related injuries, illnesses, and near misses
    - Investigate causes of incidents or near misses
    - Take the appropriate action to prevent recurrence
  - Ensure prompt medical attention

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Roles and Responsibilities (cont'd)

- Safety Professional
  - Develop and implement accident prevention programs
  - Advise management on company policies and governmental regulations
  - Evaluate effectiveness of existing safety programs
  - Train management in safety observation techniques

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Why Have a Plan?

- Designed to Protect
  - Personnel
  - Environment
  - Public
  - Operation and Equipment

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Why Have a Plan (cont'd)

- Government Regulations
  - OSHA
  - EPA
  - State/Local
- Public/Private Requirements

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Typical Programs

- Recordkeeping
  - OSHA 300 log and supplementary forms
  - OSHA 301, accident investigations
  - Workers' compensation cases
  - Employee's medical history

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Typical Programs (cont'd)

- Personal Protective Equipment (PPE)
  - Proper use
  - Employee training
  - Enforcement
    - Dusty Operations
    - Unknown hazards
    - Hazardous waste operations and Emergency Response

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Typical Programs(cont'd)

- Hazard communication program
  - Written program development and implementation
  - Chemical Inventory
  - Communicate safe work methods for:
    - Jobs-Specific activities
    - Non-routine tasks
    - Labeling requirements
    - MSDS
    - Employee training (contractors)

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Typical Programs(cont'd)

- Machine guarding
  - Make sure that machine guarding is:
    - Replaced and tested for proper function when removed for maintenance
    - Review electrical and mechanical interlocks to see if they work properly
- Equipment Repair
  - Inspect and repair and/or replaced defective parts

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Typical Programs(cont'd)

- Lockout/Tagout
  - Make sure that lockout/tagout procedures are established
  - Employees trained
- Others
  - Confined-space entry
  - Excavation
  - Heavy equipment
  - Air monitoring

Top Violations

Citation Reference   Description

- 29 CFR 1910.1200 (e)(1) Hazard Communication
- 29 CFR 1904.2 (a)   Recordkeeping
- 29 CFR 1903.2   Signage
- 29 CFR 1910.147   Lockout/Tagout

Top Violations(cont'd)

Citation Reference   Description

- 29 CFR 1910.212 (a)(1)   Machine Guarding
- 29 CFR 1910.215 (b)(9)   Abrasive Wheel Machinery
- 29 CFR Subpart I   Personal Protective
  Equipment

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Formulating the Plan

- Team Effort Required
  - Management
  - Supervisors
  - Laborers

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Formulating the Plan (cont'd)

- Developing Scope of Work
- Identifying Controls for Reducing Hazards
- Reviewing Hazards of each Task
  - Physical
  - Chemical
  - Biological

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Formulating the Plan (cont'd)

- Review
  - Facility
  - Operations
  - Hazardous Materials
- Points to Consider
  - Details of the Plan
  - Degree of Action Required
  - Envision Potential Incidents
  - Review Previous Incidents

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Finalizing the Plan

- "User-Friendly" Plan
- Final Review
- Outside Audit

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Implementing the Work Plan

- Essential in reducing injuries and illnesses
- Maintains a safe environment
- Designed to protect employees, company's facilities, and local community

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Work Plan (cont'd)

- Pre-entry briefing to alert personnel of hazards
- Conduct Job Hazard Analysis as appropriate
- Periodic safety inspection
  – Correct known deficiencies
- Must be available for review and updated as required

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Preparing Scope of Work

- Teamwork
  - Brain Storming
- Project Impact Items
- Show Stoppers
- Delegating Responsibilities
- Project Review

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General Requirements

- Company Policies
- Site Description, Background
- Site Security
- Emergency Response

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Identifying Project-Specific Requirements

- Job Hazard Analysis
  - Select activities with highest risk
  - Break activity into individual components
  - Identify potential hazards in each component
  - Develop procedures to eliminate/reduce hazard

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Contractor Pre-qualification

- Must complete pre-qualification
  - Incident rates
  - Experience Modification Rates (EMR)
  - OSHA recordable cases
  - General company information
  - Safety programs
  - Medical surveillance programs
  - Management philosophy

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Project Start-Up

- Review Contractor's
  - Scope of work
  - H&S plan
- Site-Specific training
- Pre-Construction Meeting

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Determine Contractor Relationship

- Identify who supervises contractor employees
- Must have on-site project supervisor/manager
- Must share responsibility/liability

Contractor Project Management

- Must share responsibility/liability
- Must be able to interpret/manage safety programs, solve problems effectively
- Must have skills to recognize legal, financial, and customer relations

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Contractor-Management Responsibilities

- 29 CFR 1926.16(d)
  - "Where joint responsibilities exists both the prime and their subcontractor or subcontractors, regardless of tier, shall be considered subject to the enforcement provisions of this Act"
- 29 CFR 1926.16(c)
  - "With respect to subcontracted work, the prime contractor and any subcontractor or subcontractors shall be deemed to have joint responsibility"

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Develop Emergency Response

- Qualified to Perform
- Equipment/Response Time Adequate
- Aware of Operations and Hazards

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Problems with Emergency Response

- Guidelines NOT Followed
- Improper Initial Response
- Non-functioning Equipment
- Environmental Conditions

Emergency Response Critique

- OSHA/EPA Requirements
- Reviews Incidents
- Develops New Procedures
- Enhances Training

Continual Improvement

- Guidelines must be created for improvement
  - Company policies
  - Contractors rules/procedures
  - H&S Plan
- Learning from mistakes
- Safety must be measured and monitored

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Reviewing On-Going Operations

- Conduct site safety inspections
- Review training records and work permits
- Review air monitoring data
- Review how deficiencies are detected and corrected
- Conduct progress meetings

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Summary

- Eliminate hazards
- Reduce risks when hazards cannot be eliminated
- Provide warning devices
- Develop and implement procedures and training

Summary (cont'd)

- Engineering controls
  - Preferred
  - Permanent
  - Not as dependent on human errors as other types of controls, and is less likely to fail
    - Problem is usually corrected for good

Summary (cont'd)

- Accountability must be present
- Management commitment must be visible
- Teamwork is a requisite for success
- "Paper" safety programs are not acceptable

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THANK YOU