

GUIDELINES ON THE IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEM FOR THE METALWORKING INDUSTRY

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Occupational Safety Department and
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INTRODUCTION

These guidelines were developed by special project sub-committee of the Metalworking Industry Safety Promotion Committee (MISPC).

The members from MISPC comprises mainly safety professionals from the metalworking factories and representatives from Occupational Safety Department and Occupational Safety & Health (Training & Promotion) Centre of the Ministry of Manpower,

The objective of these guidelines is to assist the metalworking factories to implement an effective Safety Management System, which is a requirement under section 71B of the Factories (Amendment) Act 2000.

This SMS guide provides a simplified format that is easy to understand, on the implementation of the 14 elements in the Safety Management System specified in the Thirteenth Schedule of the Factories (Amendment) Act 2000. Metalworking factories should make reference to this guide in their establishment and implementation of the safety management system.

ELEMENT 1 SAFETY POLICY AND ORGANISATION

1.1 Objective

To establish a written policy in safety and health, which illustrates clearly the management's commitment and approach in providing and maintaining a safe and healthy work environment.

1.2 Contents

1.2.1 The policy shall include:

- a) a statement, which clearly articulates the company's safety objective and goals and management's commitment to achieve these objective and goals;
- b) a clear description of duties and responsibilities of employees at all levels in promoting and ensuring occupational safety and health in the organization;
- c) Acknowledgement that employees are an important resource.

1.2.2 A safety organisation shall be established to clearly define the roles, duties, responsibilities and accountabilities of every individual in the organisation.

1.2.3 The policy must be endorsed by the Chief Executive Officer or the most senior management staff of the company to demonstrate commitment of top management.

1.2.4 The policy must be well publicized, made known, understood and accepted by all levels of personnel and contractors.

1.2.5 The policy must be reviewed and revised (if necessary) on a regular basis and the date(s) of review and revised stated.

ELEMENT 2 SAFE WORK PRACTICES

2.1 Objective

To establish relevant Safe Work Practices (SWP) so that all works are carried out safely and the risks of injury to workers and property/equipment damage are eliminated or minimized.

2.2 Contents

- 2.2.1 The factory shall establish and maintain all relevant Safe Work Practices as specified in the **Twelve Schedule** of the Factories Act.
- 2.2.2 Additional Safe Work Practices shall also be established for other hazardous work or/and work processes.
- 2.2.3 All Safe Work Practices must be clearly written in an easy-to-understand format and effectively communicated. Relevant persons must receive adequate briefing and training on these SWPs. All SWPs must be readily available to workers concerned.
- 2.2.4 All Safe Work Practices are reviewed and evaluated regularly to ensure its relevance and effectiveness.
- 2.2.5 A job hazard analysis or risk assessment shall be conducted before a specific Safe Work Practice is established. This is to ensure that all potential hazards are being identified for control.
- 2.2.6 Safe Work Practice must include the potential energies that may be stored or released during work or/and in the work process, such as:-
 - a) Electrical.
 - b) Pneumatic.
 - c) Hydraulic.
 - d) Thermal.
 - e) Mechanical - compression/tension.
 - f) Gravitational.
 - g) Noise.
 - h) Radiation.
- 2.2.7 Where work is to be carried on machinery capable of releasing any energy sources, the Lockout procedure must be established. In addition, a Start-up procedure should also be established.
- 2.2.8 A permit-to-work system shall be incorporated for specialized work processes such as work in confined spaces, work involving hot work and work at height.
- 2.2.9 A system should be established to assist the factory to implement the Management of Change procedure and to re-examine the need to review existing SWPs as a result of introduction of new equipment or altered work process.

ELEMENT 3 SAFETY TRAINING

3.1 Objective

To provide and equip all employees with the required skills, knowledge and all safety related information related to the operations, work processes and maintenance of facilities and equipment to enable them to carry out their jobs safely and efficiently.

3.2 Contents

3.2.1 The factory shall analyse the occupational safety and health training needs on safety and health for all workers, including contractors.

3.2.2 A comprehensive safety-training programme shall be established in the organization. This programme shall include:

- New employee orientation
- Refresher training
- Skills and functional training
- Safe awareness training
- Manager training (e.g. auditing and accident investigation techniques)
- Contractor briefing and training

3.2.3 Statutory training requirements stipulated under the Factories Act and its subsidiary legislation must be provided to ensure that relevant personnel receive the necessary training.

3.2.4 The line managers and supervisors must be adequately trained so that they can effectively supervise and control workers' behaviour at the workplace. They should also be responsible for identifying the types of safety training for their workers.

3.2.5 All new employees and contractors must be adequately inducted and orientated. Training provided should also equip workers with the necessary skills and knowledge to perform their safety roles and discharge their responsibilities at the workplace. Structured "On-the-job" training should also be provided.

3.2.6 Safety training shall be conducted using appropriate training methods and a language understood by trainees.

3.2.7 All training conducted must be properly documented. Where applicable, certificates should be issued to trainees who have successfully completed the training.

3.2.8 The safety-training programme shall be reviewed periodically and updated when necessary.

ELEMENT 4 GROUP MEETINGS

4.1 Objective

To provide adequate facilities and effective means for effective communication of safety and health message, information and knowledge to all employees, including contractors. The factory should also motivate employees at all levels to participate in the discussion of safety and health issues arising from the workplace.

4.2 Contents

4.2.1 The factory shall establish an effective safety committee for purpose of improving, promoting and reviewing of all matters relating to the safety and health of employees.

4.2.2 The safety committee shall have a clearly defined charter with prescribed functions and responsibilities. The composition, functions and duties of the safety committee shall be in accordance with the Factories Act and the Factories (Safety Committees) Regulations.

4.2.3 Matters discussed in the safety committee meetings must be minuted and communicated to all departmental heads for their information and/or necessary action.

4.2.4 Relevant information must be communicated to all employees and contractors via an effective communication channel.

4.2.5 Where possible, the following small group meetings should be carried out to support the work of the safety committee as well as to improve communication and promote participation in occupational safety and health activities among employees:

4.2.5.1 Safety sub-committee meetings

Safety sub-committees should be established for factories with a large number of employees and many different work stations/production departments.

In these safety sub-committees, safety engineers and supervisors can be appointed to assist the committee to address occupational safety and health issues concurrently.

These safety sub-committees will conduct their own periodic safety inspections and meetings where prompt remedial actions on unsafe occurrences can be taken by themselves or the respective department heads.

4.2.5.2 Tool-box meetings

These meetings should be organised at the shift or section levels where shift-supervisors or section leaders disseminate production and safety and health information.

Safety reminders and warnings, safety precautions, dos & don'ts and/or other relevant safety rules & regulations should be issued to workers.

4.2.5.3 Safety Improvement Teams (SIT)

Teams of workmen (5 to 8 persons per team) from the same departments (production, maintenance, planning, other relevant personnel) should be established to work on specific projects to improve their work environment and processes in the interest of occupational safety and health.

Management must support these formal project teams and appropriate incentives, rewards or recognition should be given to the teams that perform well.

ELEMENT 5

INCIDENT INVESTIGATION AND ANALYSIS

5.1 Objective

To establish procedures for ensuring that all incidents (accidents and near misses) occurring in the factory is investigated promptly and effective and practical remedial measures are taken to prevent recurrence.

5.2 Contents

- 5.2.1 The factory shall establish a system to ensure that all incidents are reported promptly and responsible personnel are informed as soon as possible to facilitate investigation.
- 5.2.2 The factory shall establish written procedures for the investigation into incidents. The procedures shall include the criteria for the type and degree of seriousness of incidents to be formally investigated. All incident investigations should determine the root causes, circumstances and other contributing factors leading to the incidents.
- 5.2.3 The following personnel shall be involved in the investigation:
- a) line managers
 - b) immediate supervisors
 - c) safety personnel
 - d) safety committee members
 - e) Other authorised personnel
- 5.2.4 A system shall established to ensure that the recommendations of the investigations are effectively and promptly followed through and implemented.
- 5.2.5 Procedures shall be established to disseminate information (including the causes, remedial actions, lessons learnt and other relevant information) to all personnel in the workplace.
- 5.2.6 All incident statistics must be promptly analysed to identify major problematic areas so that appropriate recommendations/measures can be taken quickly. The analysis of incident trends and statistics shall be used for planning of promotion and training programmes.

ELEMENT 6

IN-HOUSE SAFETY RULES AND REGULATIONS

6.1 Objective

To establish written safety rules & regulations that are relevant to the organisation, in addition to the legal requirements. This involves inculcating in workmen, including contractors, their roles and responsibilities in safety whilst performing their work in the factory.

6.2 Contents

6.2.1 In addition to the legal requirements under the Factories Act and its subsidiary legislation, the factory shall establish a set of safety rules and regulations that is suitable and practical.

In the process of formulating the in-house safety rules and regulations, reference shall be made to the relevant Singapore Standards and Codes of Practice published by Singapore Productivity and Standards Board (PSB) on safety and health.

6.2.2 A safety demerit point system should be incorporated into the safety rules and regulations so that appropriate disciplinary action/s can be taken for non-compliance of the relevant safety rules and regulations.

6.2.3 Top management must endorse the safety rules and regulations with agreement from the Employees' Union (if applicable) to ensure its relevance and effectiveness.

6.2.4 The in-house safety rules and regulations must be effectively communicated and made readily available to all personnel including the contractors in the factory.

6.2.5 A scheme shall be established to enforce compliance of the rules and regulations

6.2.6 The safety rules and regulations should be reviewed periodically and revised when necessary,

(* Enforcement has to be carried out by line supervision, not ONLY the safety personnel. Safety personnel should not assume the role of "policemen")

ELEMENT 7 SAFETY PROMOTION

7.1 Objective

To develop and maintain safety & health interest and awareness amongst the workforce, and to instill a positive attitude and behaviour towards safety and health amongst all personnel at the workplace, and to help creating a caring safety culture in the factory.

7.2 Contents

- 7.2.1 The management shall develop and establish promotional programmes that clearly demonstrate the strong commitment and devotion towards providing and maintaining a safe and healthy work environment.
- 7.2.2 The promotional activities should be organized at regular intervals and should include the following:
- a) Display of the factory safety policy at various strategic locations in the factory premises,
 - b) Display of industrial accident/incident statistics,
 - c) Display of safety posters, signs, safety bulletins, newspaper cuttings or other types of safety related materials aimed at raising awareness or to emphasize a particular safety matter,
 - d) Conduct safety talks, lectures and screenings of safety related videos,
 - e) Issuance of safety handbooks, brochures or guides to all employees,
 - f) Conduct emergency response drills,
 - g) Organise special in-house safety campaigns,
 - h) Formation of safety improvement teams,
 - i) Setting up safety bulletin/notice boards in each department for effective dissemination of safety information in the plant.
- 7.2.3 All employees including contractors should be encouraged to participate in all the promotional activities organized and making positive suggestions in improving the safety and health at work.
- 7.2.4 An incentive scheme should be set up to recognize and acknowledge good safety performance or recommendations by an individual or a group. Top management should formally present such rewards and commendations.

ELEMENT 8 EVALUATION, SELECTION AND CONTROL OF CONTRACTORS

8.1 Objective

To establish a system or procedures to evaluate, select and control of contractors' working in the workplace and before any work is being awarded so as to ensure that they are aware of and meet their safety obligations.

8.2 Contents

- 8.2.1 The factory shall establish and document a system for the assessment and evaluation of contractors to ensure that only competent and qualified contractors are selected and permitted to carry out contracted works in the factory.
- 8.2.2 The selection criteria shall consist of safety performance indicators such as safety management system, safety track records, safety training records and competency in handling the job and safe working procedures.
- 8.2.3 The selection system shall incorporate a pre-approval of contractors' procedures for major or specialized work in the factory. New contractors who are not in the pre-approved list will have to be subjected to an evaluation and selection process. Existing and new contractors who do not meet the selection criteria shall be posted in the disqualified list.
- 8.2.4 All written contracts shall clearly spell out the safety, health and environmental responsibilities and obligations that the contractors have to comply with.
- 8.2.5 Prior to commence work in the factory, safety induction shall be conducted for contractors who are entering the factory for the first time. The induction shall cover basic safety requirement of the factory including emergency response, permit to work, and dos & don't, etc.
- 8.2.6 Prior to commencement of any new area/item of work in the factory, the workers shall be briefed on the safe work practices, the work's potential hazards and the safety control measures.
- 8.2.7 An effective communication chain shall be established to update all contractors of any change that has made to the existing safety and health management system.
- 8.2.8 A system shall be established to monitor and assess the contractor's safety performance throughout the progress of the work. A demerit point system can be used to record all non-conformances. The records shall be used as a criterion for future selection.
- 8.2.9 A system shall be established to control and ensure that only equipment, tools and machines that are certified to be of sound operating condition are allowed in the factory.
- 8.2.10 A system shall be established to inspect tools, equipment and machines that are brought in and in use in the factory. The inspections shall be carried out periodically by competent persons.

ELEMENT 9 SAFETY INSPECTION

9.1 Objective

To establish an effective programme to carry out periodic inspection to spot-check and correct unsafe/undesirable work practices and conditions.

9.2 Contents

- 9.2.1 The factory shall establish a formal written programme for carrying out regular safety inspections by appointed competent persons.
- 9.2.2 The inspection programme shall include safety observation and safety sampling of the unsafe behaviours at work. This is for the purpose of inculcating positive safety attitudes and behaviours amongst the workforce.
- 9.2.3 The inspection programme shall encourage employees' participation in their daily routine checking of their work areas and workstations.
- 9.2.4 All levels of management should conduct inspections that focus on the behaviour and work practices of personnel.
- 9.2.5 Daily routine inspections, surprise spot-checks, housekeeping inspections and other relevant inspections should be carried out.
- 9.2.6 The findings of the inspection shall be recorded and appropriate recommendations shall be put up to respective department heads for the necessary remedial measures.
The inspection findings, recommendations and their follow-up actions taken shall be properly documented.
- 9.2.7 Where applicable, checklists shall be generated to assist the inspection team in identifying and classifying potential hazards.
- 9.2.8 The checklists and the inspection-report-action procedure shall be reviewed to ensure their relevance.

ELEMENT 10 MAINTENANCE REGIME

10.1 Objective

To establish an effective and practical maintenance regime for all statutory equipment, machineries, equipment and tools used in the factory so as to prevent occurrence of accidents because of failure of such equipment and machinery.

10.2 Contents

- 10.2.1 The factory shall implement a maintenance programme which shall include the following:-
- a) A master checklist of all hand tools, plant, machineries and equipment;
 - b) An inspection and maintenance schedule. Responsibilities of the members of the inspection teams should be listed and relevant follow up inspection should be established.
 - c) Checklists could be developed for the various inspection teams to carry out their inspections. Specific items could be listed for the inspection teams to take note when carrying out their inspections.
 - d) Inspection reports should be forwarded to the relevant supervisors and managers for immediate corrective actions.
- 10.2.2 The management should evaluate the operational compliance and adequacy of such checklists at least once a year.
- 10.2.3 All inspections and maintenance must be carried out by competent/approved persons.

ELEMENT 11 HAZARD ANALYSIS

11.1 Objective

To establish systematic procedures for identification, evaluation and control of hazards in the workplace.

11.2 Contents

11.2.1 The factory shall conduct hazard analysis for the followings:

- a) Routine and non-routine work activities, including those carried out by contractors and their employees;
- b) Facilities and equipment.

11.2.2 The evaluation process shall include:

- a) Consideration of probable hazardous incident/s (including the worst case scenario), and the impacts on the factory, its activities as well as the workers.
- b) The activities or work processes should be broken up into steps where specific hazards can be identified.
- c) Development of counter measures to eliminate these hazards should be included.
- d) The implementation of the measures recommended shall be tested, where possible.
- e) Documentation of the above process should be carried out and incorporated into 'Safe Work Practices'.

11.2.3 Hazard analysis shall be reviewed whenever there are change(s) in conditions or any modification of equipment or processes or any introduction of new materials. The 'Safe Work Practices' developed from the previous hazard analysis must also be reviewed and revised accordingly.

ELEMENT 12 CONTROL OF MOVEMENT AND USE OF HAZARDOUS SUBSTANCES

12.1 Objective

To establish a system for the identification and management of all hazardous substances through the establishment of well defined procedures for the receipt, issuance, storage, handling and use of hazardous substances in the factory.

12.2 Contents

12.2.1 To develop a written hazard communication program or procedure which should include the following:

- a Maintain a register or list of hazardous substances in use in the workplace. The register should include the inventory and location of use of the hazardous substances. An appropriate Material Safety Data Sheet (MSDS) is made available for each hazardous substance. A documented system should be established for obtaining new and revised MSDS.
- b Develop appropriate procedures for the receipt, storage, issue, distribution, transportation, handling and use of the hazardous substances. Procedures should also identify incompatible materials and potentially hazardous combinations and conditions that require special preventive or protective measures. High-risk processes should be identified and special procedures developed.
- c Establish procedures for the use of personal protective equipment for handling, and use of hazardous substances.
- d Appoint a technically competent person to administer the control, procurement and storage of the hazardous substances.
- e All containers used for storing the hazardous substances must be labeled, tagged or marked with the following information:
 - o Identification of the hazardous chemical(s)
 - o Name used on MSDS and in chemical list
 - o Hazard warning and control

12.2.2 Provide designated storage area for the hazardous substances. Small quantities of chemicals shall be stored in chemical storage cabinets and be segregated by distance and/or physical barriers from other incompatible substances. Drummed or bulk chemicals (including fuels and oils) should be stored in an area that provides secondary containment.

Chemical storage areas should be inspected on a routine basis to ensure integrity of chemical containers and secondary containment systems.

- 12.2.3 Hazard communication training should be organised for all employees who may be exposed to the hazardous substances. Special training should be conducted for persons performing non-routine tasks involving hazardous chemicals. The training should review the hazards of the chemicals, special work procedures, handling rules and precautions, personal protective equipment and spill prevention and containment procedures. Training records should be properly maintained.
- 12.2.3 Establish procedures for the prevention of spills of the different types of chemicals used in the workplace. Such procedures should address both small and large spills and their disposal in accordance with the statutory requirements.

ELEMENT 13 OCCUPATIONAL HEALTH PROGRAMMES

13.1 Objective

To protect all personnel from the occupational diseases and illness through the identification, evaluation and control of health hazards present in the workplace.

13.2 Contents

- 13.2.1 The factory should identify the potential occupational health hazards related to the work activities, processes and chemicals used or produced in the processes.
- 13.2.2 The Material Safety Data Sheet (MSDS) should be made available for the chemicals used.
The precautionary measures and safe work procedures for the safe use, handling, transport, storage and disposal for the related chemicals should also be made available.
- 13.2.3 It should develop relevant occupational health programmes, which shall include noise conservation, respiratory protection, and industrial hygiene programmes.
These programmes should be made known to all personnel in the factory.
- 13.2.4 The responsibilities of all individuals ranging from workers to management, pertaining to the implementation of the health programme shall be clearly defined.
- 13.2.5 Where applicable, the following methods of control should be used:-
- a) Elimination or substitution.
 - b) Engineering controls, including modification of work process or equipment.
 - c) Administrative controls.
 - d) Use of personnel protective equipment supplemented by appropriate medical examination, training and education.
- 13.2.6 A system shall be established where responsible personnel are to continuously monitor the effectiveness of the control measures taken (including the improvement of the work environment as well as the well-being of the affected workmen). Where necessary, the occupational health programme shall be reviewed periodically.

ELEMENT 14 EMERGENCY PREPAREDNESS

14.1 Objective

To establish a written response plan to mitigate consequences arising from potential emergency situations and to familiarize employees with the response procedures in the event of an emergency.

14.2 Contents

14.2.1 The factory shall establish procedures to:

- a) Identify emergency situations and assess their impact;
- b) Implement the emergency response plan at each level of the organisation, with clear scope, roles and responsibilities; and
- c) Maintain an up-to-date emergency response plan.

14.2.2 The emergency response plan shall cover at least, but not limited to, the following areas:-

- a) Fire and explosion;
- b) Toxic gas leakage;
- c) Chemical Spill; and
- d) Failure and collapse of structure.

14.2.3 The emergency response plan shall include :

- a) Establishing an Emergency Team and its responsibilities.
- b) Appointment a competent Emergency Scene Controller who shall direct the execution of emergency procedures in accordance with the situation.
- c) Procedures for notification and raising of alarms.
- d) Procedures for evacuation and rescue.
- e) Procedures and means of rescues and first aids.
- f) Means of communication with the relevant government response agencies such as SCDF, PUB and Police.

14.2.4 The emergency response plans shall be documented and effectively communicated to all employees in the factory.

14.2.5 An emergency response drill shall be conducted at least once every 12 months with the participation of all personnel in the factory. An evaluation of the drill performance shall be carried out and the necessary improvements made to the plan.

14.2.6 The factory shall establish training programmes of drills and exercises for individuals and integrated emergency response teams on their roles and responsibilities, as defined in the plan. The program shall also assess the preparedness of the team for prompt and effective response to an emergency situation.

ELEMENT 15 DOCUMENT CONTROL AND REVIEW

15.1 Objective

To establish an effective system to document & record the establishment and maintenance of the 14 elements in the Safety Management System. This is to facilitate easy and effective retrieval of relevant documents and also enhance the effectiveness of the system reviewing process.

15.2 Contents

15.2.1 All relevant documents shall be maintained and updated, with controlled reference-numbers.

15.2.2 A master list shall be generated, which includes checklists, controlled documents register and distribution list.

15.2.3 Documents should be easily available for personnel who require them.

15.2.4 Obsolete, invalid and cancelled documents should be promptly removed.

15.2.5 All revisions of documents should be properly recorded and authorised by the management prior to distribution. The following document control should be followed:-

- a) An identifier (controlled reference-number)
- b) Date of issue or review
- c) Revision number
- d) Descriptive title
- e) Authorised signatory

15.2.6 Review of Safety Management System

The purpose of reviewing is to evaluate the relevancy of the existing Safety Management System and its elements in respect to the organisation.

- a) The management shall conduct internal safety audits to verify whether the safety & health activities and programmes comply with the SMS.
- b) Personnel conducting the audit should be competent and independent of the areas being audited.
- c) An external independent Safety Auditor shall audit the SMS annually.
- d) The results of the safety audit and review should be distributed to all personnel responsible in the area involved.
- e) The management should ensure that all appropriate corrective actions are taken.

REFERENCES

- 1 Factories Act (Cap 104) and its subsidiary legislations
- 2 Environmental Pollution Control Act 1999 and its subsidiary legislations
- 3 Fire Safety Act
- 4 Radiation Protection Act 1991
- 5 Relevant Codes of Practice
- 6 Relevant Singapore Standards