



# OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT SYSTEM IN TEXTILE INDUSTRY – A CONTINUAL IMPROVEMENT APPROACH

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**Abstract:** This paper shares an experience on implementing the statutory elements of an occupational safety and health management system model in the working environment of a textile testing laboratory in Hong Kong. A continual improvement, Plan-Do-Check-Act (P-D-C-A), approach was used. In the statutory models in Hong Kong, 14 elements, (i) safety policy, (ii) safety organization, (iii) safety training, (iv) in-house safety rules and regulations, (v) inspection programme, (vi) personal protection equipment programme, (vii) accident / incident investigation, (viii) emergency preparedness, (ix) control of sub-contractors, (x) safety committee, (xi) job hazards analysis, (xii) safety promotion, (xiii) process control programme and (xiv) health assurance programme, were contained. Through the implementation of these elements in a continual improvement approach, some benefits were observed, thus discussions were made based on those benefits observed.

## 1. Introduction

With the reference to the Occupational Safety and Health Management System Model in Hong Kong [1], the model for implementing the Occupational Safety and Health Management System includes (i) planning, (ii) developing, (iii) organizing, (iv) implementing, (v) measuring and (vi) auditing [1]. Under this model, 14 elements, including, (i) safety policy, (ii) safety organization structure, (iii) safety training, (iv) in-house safety rules and regulations, (v) programme for inspection for identifying hazardous conditions, (vi) programme for identifying hazards and risk and provide personal protection equipment, (vii) accident / incident investigation, (viii) emergency preparedness, (ix) evaluation, selection and control of sub-contractors, (x) safety committee, (xi) job hazards analysis, (xii) safety promotion, (xiii) process control programme and (xiv) health assurance programme, were contained. These elements including in the model actually guide the application of a fundamental improvement strategy known by any of four names: P-D-C-A, plan-do-check-act, the Shewart cycle, or the Deming cycle, which also revealed from the ultimate objective of continuous improvement of the Occupational Safety and Health Management System Model. Table 1 below shows the P-D-C-A Cycle of the Occupational Safety and Health Management System. In the Table 1, it was noted that the implementation of the 14 elements was done in both the Plan Stage (the planning, developing and organising stages of the Occupational Safety and Health Management System Model) and Do Stage (the implementation stage of Occupational Safety and Health Management System Model) of the P-D-C-A cycle. In the following sections, all the italic items and elements stated in Table 1 will be addressed in more details using the working environment of a textile testing laboratory in Hong Kong as an explaining example.



**Table 1: P-D-C-A cycle of the occupational safety and health managements system**

|   |   |
|---|---|
| <p><b>ACT</b></p> <p>(i) Corrective action<br/>(ii) Management review (periodic status analysis)</p>            | <p><b>PLAN</b></p> <p>Planning, Developing and Organising</p> <p>(i) <i>Initial status analysis</i><br/>(ii) <i>Project planning</i><br/>(iii) <i>Risk assessment</i><br/>(iv) <i>Understanding current legal requirements</i></p> <ul style="list-style-type: none"> <li>◆ <i>Safety Policy</i></li> <li>◆ <i>Safety organisation structure</i></li> <li>◆ <i>Safety training</i></li> <li>◆ <i>In-house safety rules and regulations</i></li> <li>◆ <i>Programme for inspection for identifying hazardous conditions</i></li> <li>◆ <i>Programme for identifying hazards and risks; and provide personal protection equipment</i></li> <li>◆ <i>Accident / incident investigation</i></li> <li>◆ <i>Emergency preparedness</i></li> <li>◆ <i>Evaluation, selection and control of sub-contractors</i></li> <li>◆ <i>Safety Committee</i></li> <li>◆ <i>Job hazard analysis</i></li> <li>◆ <i>Safety promotion</i></li> <li>◆ <i>Process control programme</i></li> <li>◆ <i>Health assurance programme</i></li> </ul> |
| <p><b>CHECK</b></p> <p>Measuring and Auditing</p> <p>(i) Safety audit<br/>(ii) Accident statistics analysis</p> | <p><b>DO</b></p> <p><b>Implementing</b></p> <ul style="list-style-type: none"> <li>◆ <i>Safety Policy</i></li> <li>◆ <i>Safety organisation structure</i></li> <li>◆ <i>Safety training</i></li> <li>◆ <i>In-house safety rules and regulations</i></li> <li>◆ <i>Programme for inspection for identifying hazardous conditions</i></li> <li>◆ <i>Programme for identifying hazards and risks; and provide personal protection equipment</i></li> <li>◆ <i>Accident / incident investigation</i></li> <li>◆ <i>Emergency preparedness</i></li> <li>◆ <i>Evaluation, selection and control of sub-contractors</i></li> <li>◆ <i>Safety Committee</i></li> <li>◆ <i>Job hazard analysis</i></li> <li>◆ <i>Safety promotion</i></li> <li>◆ <i>Process control programme</i></li> <li>◆ <i>Health assurance programme</i></li> </ul>  |

## 2. Initial Status Analysis

In order to establish an Occupational Safety and Health Management System, the first and most important step is to carry out a review of the arrangements and procedures already in place. A gap can then be identified to ease the set up of the system. Although this initial status review seemed to be an onerous task at the first sight, however, it showed quickly that occupational safety and health is already part of the laboratory's management arrangement. As a matter of fact, the laboratory is operating some kind of occupational safety and health management system, may be unsophisticated, may be not totally complied with safety and health legislation, but it will be there. The initial status review actually helps the laboratory to find out (i) where the laboratory is now in managing occupational safety and health issues; (ii) what



needs to be done in the occupational safety and health issues; (iii) what helps and information are available from outside sources; and (iv) most important, which of this is relevant to the working environment of the laboratory.

In the laboratory, the initial status review was conducted by making use of a self-assessment questionnaire which was designed to review the present implementation status of the proposed Occupational Safety and Health Management System. There were totally 50 questions in the self-assessment questionnaire with three options for each question namely: “Yes”, “No” and “Partly”. One (1) point was assigned for the “Yes” option, zero (0) point for “No” and half (1/2) for “partly”. The total score obtained was then compared to the following performance rating table which was modified from the one described by a professional safety and health organisation in Hong Kong [2]:

Forty (40) questionnaires were being distributed to the management, all division heads and some laboratory supervisors for completion as they were the main driving force for the implementation of the Occupational Safety and Health Management System. All sent out questionnaires were completed and returned. The score was calculated and found to have an average of 17.25 points which indicated that there was a poor safety and health program and help was needed. So, the senior management of the laboratory was then decided to seek help from outside professional bodies to conduct a risk assessment on the laboratory and assigned a Company Safety Officer to be in charge for establishing an Occupational Safety and Health Management System in order to improve and enhance the safety and health standard of the laboratory.

### 3. Project Planning

A project plan for establishing an Occupational Safety and Health Management System was then developed. The whole project was divided into the following three phases:

#### **Phase I: Planning, Developing and Organising Stage**

- ◆ Initial status review and risk assessment
- ◆ Understand the current legal requirement
- ◆ Safety policy setting

#### **Phase II: Implementation Stage**

- ◆ Safety organisation structure
- ◆ Safety training
- ◆ In-house safety rules and regulations
- ◆ Programme for inspection for identifying hazardous conditions
- ◆ Programme for identifying hazards and risks; and provide personal protection equipment
- ◆ Accident / incident investigation
- ◆ Emergency preparedness
- ◆ Evaluation, selection and control of sub-contractors
- ◆ Safety Committee
- ◆ Job hazard analysis
- ◆ Safety promotion
- ◆ Process control programme
- ◆ Health assurance programme



### **Phase III: Measuring, Auditing, Reviewing and Corrective Action Stage**

- ◆ Safety audit
- ◆ Accident statistics
- ◆ Corrective action
- ◆ Management review (periodic status analysis)

## **4. Risk Assessment, Job Hazards Analysis and Understanding the Legal Requirement**

As discovered from the initial status review, there was a need to seek help from other professional bodies on this safety and health issue. Consultant from a Safety and Health Consultant Company was finally appointed to conduct a risk assessment on the laboratory. Moreover, during the assessment, the compliance of the laboratory practices or operations with the current applicable statutory requirements and Code of Practice. Risk assessment was being conducted in order to determine whether planned or existing controls were adequate. The intention was that risks should be controlled before harm could occur.

### **4.1. Potential hazards identified in the laboratory**

In the risk assessment, the following potential hazardous areas were being identified in the testing laboratory and office environment, i.e. (1) Chemical Hazards, (2) Fire Hazards, (3) Slip and trip, (4) Electrocutation, (4) Cuts and laceration, (5) Burn, (6) Ergonomic hazard and (7) Biological hazard.

### **4.2. Safety policy**

For any safety program to be truly effective, its purpose and intention must be clearly defined. A clear defined purpose was essential, since the management of the laboratory could only determine success or failure by measuring the variance between the expected and the actual. In addition, everyone in the Laboratory must understand senior management's commitment to the effort, so that full co-operation was possible [3]. A written safety policy statement was a mandatory first step in any effort to establish an effective safety program in the laboratory. In fact, a safety policy statement became the foundation upon which the entire program was built. For this reason, a policy statement indicating, in clear and simple terms, the laboratory's safety and health policy objectives and the arrangements to achieve those objectives, including the allocation of functions and responsibilities has to be prepared. Moreover, the policy was signed by the Chief Executive Officer to demonstrate the commitment of the senior management. The signed policy was also disseminated to all staffs in the laboratory to let them understand the senior management's attitude towards safety and health.

### **4.3. Safety organisation structure and safety committee**

Although having senior management commitment to enhance and improve the safety and health of the laboratory as revealed from the safety policy, however, without proper organisation to implement the occupational safety and health management system, most probably it could not make the implementation of the system to be a successful one. So, a safety and health committee



had been formed in order to facilitate and co-ordinate the implementation of the Occupational Safety and Health Management System.

#### 4.3.1. Company Safety Officer

A Company safety officer has been appointed by the Chief Executive Officer. He / She must be a member of senior management and report directly to the Chief Executive Officer.

#### 4.3.2. Divisional Safety Officer

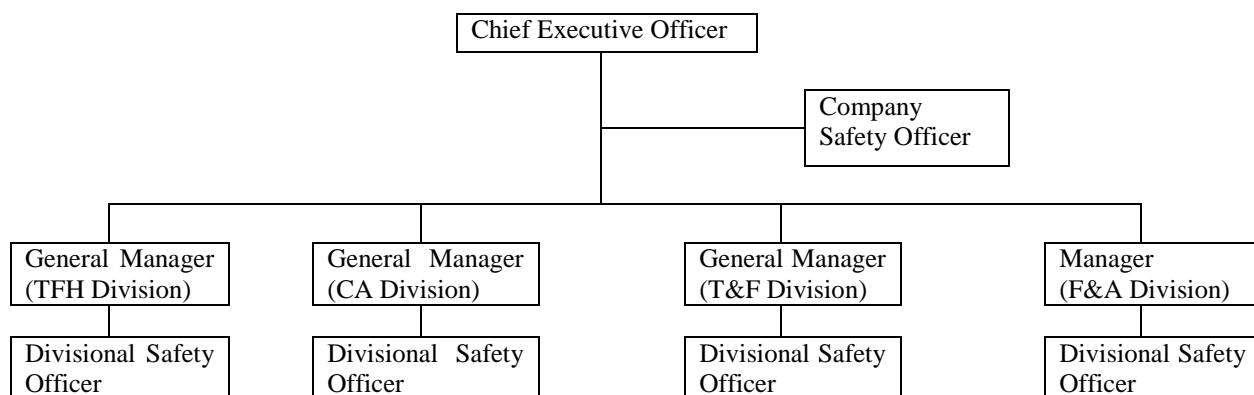
Apart from the Company Safety Officer, it was also necessary to appoint the Divisional Safety Officer particular in the three high risk testing divisions, namely Textile and Footwear Division (T&F Division), Conformity Assessment Division (CA Division) and Toys, Food and Hardlines Division (THF Division). The appointed personnel should have a senior position in the division such as section manager or supervisor. Sufficient safety training must also be provided to the appointed personnel.

#### 4.3.3. Company Safety Committee

A Company Safety Committee has to be formulated to:

- ◆ Ensure that the safety policy is understood at all levels;
- ◆ Oversee the implementation of the safety policy;
- ◆ Promote safe practices and awareness of health issues within the Laboratory;
- ◆ Ensure that safety training is carried out on a continuing basis for all levels of staff, especially those newly employed or transferred; and
- ◆ Keep the safety policy under periodic review.

The representative of senior management should be the member of this Company Safety Committee with the Company Safety Officer as the safety adviser. This committee would hold monthly meeting to discuss the related issues and minutes of meeting stating all the action items, responsible person and time frame would be prepared and distributed to all relevant parties. The Company Safety Committee was formed as follows in Figure 1:



*Figure 1: Organisational chart of company safety committee*



#### **4.3.4. Divisional Safety Committee**

Divisional Safety Committee was also required to form in the three testing divisions. With the Divisional General manager be the chair-person, the Divisional Safety Officer be the safety adviser and members from various sections having different position ranks such as supervisors, engineer, technician, clerk, etc, in the division. This committee would hold monthly meeting.

#### **4.4. Safety training [4, 5]**

To ensure an effective Occupational Safety and Health Management System, it is essential that everyone is competent to take on the duties assigned to them. So, for those persons whose work may create (either directly or indirectly) a significant impact upon the occupational safety and health situation in the laboratory, appropriate training was to be received. Some of the training were in-house developed and delivered to the appropriate staff while the others were organised by the external bodies. All these safety training have to be recorded and kept by the assigned personnel in each division.

#### **4.5. In-house safety rules and regulations**

In establishing an Occupational Safety and Health Management System, documentation is an essential element. The documentation should reflect the particular needs of the laboratory and should support the Occupational Safety and Health Management System. It should also be kept up to date, readily available, simple and understandable. Several types of document were being developed including safety manual, safety rules and regulations and safety instruction.

#### **4.6. Safety inspection**

Systematic safety and health inspection of the workplaces, which plays a key role in the control of workplace safety and health hazards, has to be planned, organised and conducted. Such inspection can help to ensure that the workplace complies with all relevant safety and health legislation, standards and Code of Practice. Effective occupational safety and health inspection programs are one of the most important preventive measures that can be taken to ensure a good safety and health-working environment. After inspection, an inspection report would then be prepared listing down the problematic or hazardous areas, the recommended corrective and preventive actions and its priority or urgency of the actions which need to be taken.

#### **4.7. Programme for identifying hazards and risks; and provide personal protection equipment**

The management of the laboratory should ensure the correct use, maintenance and storage of personal protection equipment, plus adequate training, information and instruction to employees on the safe and proper use and maintenance of personal protection equipment.

#### **4.8. Accident / incident investigation**



Reporting and investigation of accidents / incidents are vital part of an accident prevention program. Accident / incident investigation can provide accurate and timely information which can be used for preventing future accidents / incidents [6-8]. Every accident / incident should be investigated irrespective of the seriousness of the consequences. Both minor and major accidents / incidents have the same chance of occurrences when an accident / incident occurs, the prime concern is for the injured person. The injured person should have immediate access to first aid and medical facilities. Unless the injured person is well enough to be questioned at the scene, he / she should not be further upset with questions. The investigation process should begin promptly once the injured person is properly taken care of.

#### **4.9. Emergency preparedness [9-11]**

While accident prevention is the ultimate goal of the occupational safety and health program, the laboratory was well prepared to tackle any loss case emerged. So the emergency plan on fire, injuries and illness, hazardous chemical spillage and bio-hazardous material spillage were prepared to specify the procedures for handling the situations which require immediate attention.

#### **4.10. Evaluation, selection and control of sub-contractors**

In the laboratory, some jobs, such as decoration and installation of electrical appliance were contracted out to contractors. Depending on the type of contractor required, different occupational safety and health requirements were developed, varying from minimal (low risk contract) to extensive (high risk contract). An approach of the requirements was to categorise the job and contract and use the category to determine the requirements of the contractor.

#### **4.11. Safety promotion**

In order to promote the safety and health of the working environment in the Laboratory, the shared responsibilities of both employer and employees on the safety and health issues, and the safety awareness of all staffs, promotion work such as (i) Posting of safety and health related posters, leaflets and news in the notice board which was obtained from Government Authority, (ii) Circulation of safety journal, bulletins and articles to all divisional heads and sectional heads, (iii) Publication of company newsletter with central theme on occupational safety and health, (iv) Safety quiz with present, and (v) Safety suggestion box were conducted.

#### **4.12. Process control program [12]**

In the laboratory, the process control program is concerned with the accident control and hazards elimination before employees are exposed to any adverse working environment. The process control program includes the formulation of policy on reviewing of operation processes at the conception and design stages, setting of parameters for the processes and materials to take account of any changes, and development of a regular monitoring mechanism.

#### **4.13. Health assurance programme**



Health surveillance was conducted in the Laboratory for all employees. The primary objective of the health surveillance programme in the laboratory is to detect the adverse health effects at an early stage, thereby enabling further harm to be prevented. In addition, the results of the health surveillance can provide the following means to the laboratory, i.e. (1) Checking the effectiveness of control measures, (2) Providing feedback on the accuracy of the risk assessment, and (3) Identifying and protecting individuals from increased risk.

## 5. Conclusion

As a matter of fact, all the sections described in this paper were the key elements in establishing the Occupational Safety and Health Management System. Through the implementation of these elements, the benefits of the Occupational Safety and Health Management System could be observed. However, the effectiveness and suitability of the established Occupational Safety and Health Management System have to be measures and monitored so that improvements could be identified.

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