CHAPTER 1

INTRODUCTION

1.1 Introduction

High amount of air contaminants existed in the air show that the indoor air quality of the workplace is in a low level. Poor level of air quality in a building will lead to the presence of sick building syndrome among the occupant. Sick building syndrome (SBS) is used to describe a situation in which building occupants experience acute health and comfort effects that appear to be link to time spent in a building, but no specific illness or cause can be identified (Environmental Protection Agency and Environments Division, 1991). SBS becomes evident when occupants of a home or building experience health problems which have an unknown cause. SBS usually occurs when much time is spent in a home or building. In many cases the actual cause of the problem cannot be identified. The health problems may be evident with occupants who spend much time in a certain room or area of the structure, or may be a problem throughout the entire structure.

Other than Sick Building Syndrome, metal fume fever is also one of the effects of poor air quality. Metal fume fever is one of the oldest known occupational diseases which arise due to excessive exposure to metal fumes. This flu-like symptoms that may be

mistaken for the flu, is caused by inhalation of metal fumes or dust generated from industrial activities such as grinding, machining, sawing, sanding and welding (Alert, 1987). The exposure to different types of metal will results in different types of effects. For example, excessive inhalation of aluminum will result in sickness to nervous system and respiratory system, while cadmium will affect kidneys and gastrointestinal tract (Philp, 2001). According to (Ahsan *et al.*, 2009), it is estimated that 1,500 to 2,500 cases of MFF occur annually in the United States which occurs most commonly in welders. In their further explanation, they claimed that there were approximately 700 metal fume exposures reported to US Poison Control Centers in 2006.

In order to achieve a healthy workplace, industrial hygiene has been introduced and implemented in workplaces since early 1900s. Industrial hygiene is defined as "that science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community" (Occupational Safety and Health Administration (OSHA) office of Training and Education, 2016). The environmental factors or stresses in the workplace refer to elements such as indoor air quality, airborne hazards, noise exposure, chemicals, biohazards, and thermal stress. These elements need to be monitored by a person called Industrial Hygienist who has received specialized training in recognition, evaluation, and control of workplace stressors and achieved competence in industrial hygiene (WIPO, 1986).

As the problem on indoor air quality is a huge concern, government has launched an Industry Code of Practice on Indoor Air Quality 2010 in August 2010. This code of practice has been drawn up to ensure employees and occupants are protected from poor indoor air quality that could adversely affect their health and wellbeing, and thereby reduce their productivity (Abdullah, Samah and Tham, 2012). In order to achieve a healthy workplace, this code of practice Good indoor air quality (IAQ) is required for a healthy indoor work environment. Poor indoor air quality can cause a variety of short-term and long-term health problems. Health problems commonly associated with poor IAQ include allergic reactions, respiratory problems, eye irritation, sinusitis, bronchitis and pneumonia. It is the general

duties of employers and self-employed persons to their employees as stipulated under Section 15 of Occupational Safety and Health Act 1994 (OSHA) while Section 17 of OSHA stipulated that it is also the general duties of employers and self-employed persons to persons other than their employees (DOSH, 2004).

A safe and healthy workplace has always become a dream and a need for workers. As prescribed under the Occupational Safety and Health Act 1994 [Act 514], it is one of the general duties of the employer and an occupier (including building owner and building management) to provide a safe workplace to their employees or other person than his employees (Rogério dos Santos Alves; Alex Soares de Souza, 2014). A safe and healthy workplace is defined as a state of complete physical, mental and social wellbeing, and not merely the absence of disease and it is free from environmental factors or stresses (Joan Burton, 2010).

Under industrial hygiene program, it is vital for company to do documentation related to indoor air quality in their workplaces. Any activities or programs done in order to maintain a good indoor air needed to be documented. For example, the complaint reports and investigation report are needed to be documented. The documentation is done on purpose to produce a reference to be referred in the future. For example, management should do documentation after they are done with the complaints and investigation. This will ensure that the information about the complaints and investigation is available to be communicated to all affected personal. As stated in Industrial Code of Practice on Indoor Air Quality 2010, all records that are generated under this industry code of practice shall be kept for a period of not less than five years. However, the assessment report should be kept for a period of not less than thirty years. The records that should be kept are such as complaint records, investigation reports, assessment reports and training record.

To enhance the effectiveness of industrial hygiene program, several frameworks, guidelines, and model have been proposed such as WHO Healthy Workplace Model: Avenues of Influence, Process and Core Principles and Health Risk Assessment (HRA). Some of the systems show an improvement on the effectiveness of indoor air quality implementation program, but industries are still looking for better system to enhance the workplace conditions.