

The Responsibility of Building Owner/ Management for Indoor Air Quality Compliance in Malaysia

Mohd Norhisyam Omar

Department of Occupational Safety and Health (DOSH), Malaysia

Introduction:

Indoor Air Quality (IAQ) is one of important area in Occupational Health as most of us will spend almost 90% of our time in indoor area (S.C. Lee et al. 2000). There are also studies that shows 80% of our time is spent in buildings either at work or at home (Yang. C.H et al. 2007). Among other reasons why IAQ is important because of indoor air contaminant ranks in the top five for environmental health risks as shown in a study conducted by the U.S. Environmental Protection Agency in the United States, and the World Health Organization reports that indoor air pollution contributes 2.7% to global disease (A. Norhidayah et al. 2013).

Malaysia has hot and humid climate and the air conditioning plays an important part in the office building system. Previously, mechanical ventilation air conditioning (MVAC) systems were only installed in offices or multi-storey buildings where offices were located, but now, almost all places, especially public place such as post offices, schools and police stations, have also been equipped with MVACs. Poor indoor air quality can result in significant adverse impacts on health and environment. Moreover, these impacts will carry a significant cost burden to the economy and also legal implications as happened in United States (ASHRAE, 2009).

Department of Occupational Safety and Health (DOSH), agency under the Ministry of Human Resources is the authority responsible for OSH in Malaysia including IAQ aspects in the workplaces. Legislation of IAQ dates back to early 2005 when DOSH launched a Code of Practice on Indoor Air Quality 2005 (COP 2005), which primarily aimed to ensure that employers work voluntarily in assessing risks of IAQ in the workplace. In August 2010, DOSH introduced an extensive legislation known as Industry Code of Practice on Indoor Air Quality 2010 (ICOP) to replace COP 2005.

The ICOP states that all buildings, or any part of a building or a totally enclosed area, that are served by mechanical ventilating and air conditioning (MVAC) systems, including split units, must apply this ICOP if there are people working inside the building. However, this ICOP does not apply to:

- i. domestic buildings;
- ii. any area or any part of a building which is constructed, used or intended to be used for domestic or industrial purposes;
- iii. any area or part of a building where any chemicals hazardous to health are used for analytical, research or preservation purposes; or
- iv. removal and disposal of asbestos containing materials.

In the ICOP, eleven (11) parameters are listed as potential indoor air contaminants. These parameters are divided into two main categories: physical parameters and indoor air contaminants. The parameters for indoor air contaminants are categorised into three (3) different groups: chemical contaminants, biological contaminants and ventilation performance indicators. All these parameters are shown in **Table 1** below.

Table 1: Indoor Air Parameters in ICOP IAQ 2010 (DOSH 2010)

Physical Parameters	Acceptable Range		
(a) Air temperature	23 – 26°C		
(b) Relative humidity	40-70%		
(c) Air movement	0.15 – 0.50 m/s		
Indoor Air Contaminants	Acceptable Limit		
	ppm	mg/m ³	cfu/m ³
<u>Chemical Contaminants</u>			
(a) Carbon monoxide	10	-	-
(b) Formaldehyde	0.1	-	-
(c) Ozone	0.05	-	-
(d) Respirable particulates	-	0.15	-
(e) Total volatile organic compounds (TVOC)	3	-	-
<u>Biological Contaminants</u>			
(a) Total bacterial count	-	-	500
(b) Total fungal count	-	-	1000
<u>Ventilation Performance Indicator</u>			
(a) Carbon dioxide	C1000	-	-

Compliance to the ICOP:

The ICOP is a reference standard for IAQ in workplaces based on the scope stated before and at the same time acts as a legal instrument to DOSH. While there are some compulsory elements in the ICOP, most of the contents in the ICOP are act as guidance for building owners/ management on how to maintain good IAQ in their buildings. Here is the list of responsibilities for building owner/ management as stipulated in the ICOP.

a. Complaint Procedure

The building owner/ management shall establish a complaint procedure for the occupants if there is any issue or grievance due to indoor air quality. The ICOP set a minimum criteria of a complaint procedure which include:

- i. documentation for the receiving the complaint (the contents of the procedure shall include signs and symptoms of discomfort or affected by the IAQ, alleged location and date/ time of complaint);
- ii. description of process for response to the complaint;
- iii. appointment of specific person-in charge for the complaint process;
- iv. how to communicate with the complainant for a remedial action;
- v. regular reviews of complaint; and
- vi. follow-up procedures for action to be taken, in case for remedial action that been identified or implemented.

b. Investigation

When building owner/ management receive a complaint from occupants, they shall ensure that an investigation is conducted to ascertain the cause of the complaint and to determine the validity of the complaint. If there is an obvious solution or the building owner/ management have an instant remedial action, they need to take action immediately to rectify the problem.

If they can't identify or resolved the situation, an assessment by IAQ assessor shall be conducted. Assessor will conduct an assessment according to the guidance from ICOP which covers aspects that consists a measurement or monitoring airborne for parameters listed in Table 1, workers' health survey for sickness symptoms and observation of physical condition of the workplaces.

From the investigation, if there is any employee showing or having significant symptoms of building related illnesses or sick building syndrome, the building owner/ management shall notify the employer and the employer shall send the employee for a medical examination.

Investigation process shall also be conducted if the numbers of occupancy is exceeded the design or recommended number from original capacity or if there is a renovation that involve significant changes to the ventilation system in the building.

c. Maintaining Physical Parameters

Building owner/ management shall maintain and monitor their building environment conforming to the acceptable range for physical parameters which are air temperature (23 – 26°C), relative humidity (40-70%) and air movement (0.15 – 0.50 m/s)) as specified in the Table 1. The value of these parameters need to be maintain and be monitored regularly to ensure the compliance to this requirement.

d. Control of System and Activities

- i. Intervention or mitigation measures if assessment report indicates the IAQ is unacceptable (for a situation that involve IAQ assessor conduct the assessment);
- ii. Microbial contamination – regularly inspect components, parts of internal buildings surface that likely will intentionally or unintentionally accumulate water or any situation could reasonably cause microbial growth;
- iii. Inspection and maintenance of mechanical ventilation air-conditioning (MVAC) system – schedule of maintenance shall be in accordance to manufacturer manual/ requirements, or else if not specified, the frequency is at least every six months;
- iv. Controlled for prescribed activities – ensure the adequate and suitable work procedures and control are used for activities such as painting or coatings, pest control, cleaning carpets, applying or removing floor, applying caulking or gauzing compounds, etc.;
- v. Prevention and control for renovation work – control of emissions, not use materials contains toxic or hazardous substance, isolations zoning, rebalancing of the air distribution if building air-conditioning system affected by renovation work, etc.;
- vi. Pest control activities – licensed pest control operator and adhere to procedures or requirements by relevant authorities;

- vii. Housekeeping and cleaning; and
- viii. Environmental tobacco smoke (ETS) - adhere to requirements by relevant authorities.

e. Information

Building owner/ management or employer in the building shall ensure that all his employees has been informed about complaint procedure and any related information on the IAQ.

f. Instruction

Building owner/ management or employer in the building need to issue any instruction which shall be followed by occupants pertinent to maintaining a good IAQ in the building.

g. Training

Building owner/ management or employer in the buildings shall ensure that all his employees are trained on the contents of the ICOP, identification of sign or illnesses symptoms associated with poor IAQ and basic knowledge on poor ventilation or sign of deterioration of MVAC system. The training programme shall be reviewed and conducted at least once in two years, documented and kept for inspection by DOSH officer.

h. Keeping of Records

Records such as complaints, investigation reports, and training programme shall be kept for a period of not less than five years and an assessment report (if any) shall be kept for a period of not less than thirty years. If the building is stop operation and there is no successor of the owner/ management, all the records shall be transmitting to Director General of DOSH. At the end of the retention period of the record, building owner/management or employer may dispose the record by giving at least three months' notice in writing to the Director General prior to that.

Conclusions

Building owner/ management are subject to the provisions set forth in the ICOP. The ICOP is set to ensure employees or occupants are protected and building owner/ management or employer in the building abide with Section 15, 17 and 18 of Occupational Safety and Health Act (OSHA) 1994 pertaining to general duties of employers and self-employed persons to protect their employees and persons other than their employees. The ICOP also can be used as an evidence of good practice in the court, for any punitive action carried out by DOSH.

References

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