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Editorial

Work Environment Control and Occupational Hygienist in Japan

Work environment control, work control and health control are the major tools of occupational health management. Among them, work environment control is the primary measure to prevent occupational diseases or disorders associated with hazardous materials. Now in Japan, 98 hazardous chemicals that are used in the designated workplaces are obliged working environment measurement. The working environment measurement consists of two different samplings, that is, A-sampling, which is sampled randomly at 5 or more points, and B-sampling, which is sampled at the place where and time when the workers can be exposed to the highest concentration of the chemicals. Based on the results of both samplings, working environments are classified as control class I, II, and III, and when a workplace is classified as control class III, countermeasures should be carried out for improving working environment[1]. Since current working environment measurement system was introduced, work environments in Japanese industries have been remarkably improved. In 1983, about 33% of unit workplaces using dusts were classified as control class III[2], but it reduced to only 8.2% in 2010[3].

Japanese working environment measurement is a unique system in the world. In other developed countries, not the working environment measurement (stationary sampling) but measurement of personal exposure levels (personal sampling) is commonly conducted. Although both measurements determine the concentration of chemicals in air in the workplaces, not only sampling method but also basic concept on measurement is different between Japan and any other countries. The largest difference is that, in Japan, an extent of measurer's judgment on the measurement is so small. For example, the measurements of dusts, specific chemicals and organic solvents should be carried out within every 6 months even if the working environment is so excellent that the workers' health risks by the concerned chemicals are extremely small. Furthermore, methods of design and sampling are indicated in the working environment measurement standard and evaluation method is indicated in the working environment evaluation standard in detail. According to these standards, therefore, the whole measurement can be carried out as scheduled with minimum measurer's judgments.

The reason why measurement should be carried out even when the working environment is good has been explained that working environments may generally be getting worse due to poor maintenance and mechanical deterioration even if work processes and work conditions are the same. This might be true, but needless to say, enterprises should maintain working environment and workers' health on their own responsibility. In fact, in the US and European countries, reducing risk is important and measurements are not always necessary when the workers' exposure levels can be estimated much lower than the occupational exposure limits[4–6]. When the workers are exposed to chemicals but exposure levels are less than the exposure limit, periodical measurement is carried out, but intervals between the measurements are not fixed but variable depending on the exposure levels. This is reasonable and rational strategy in view of reducing risk of workers' health effectively. In these countries, industrial hygienists (IH) or occupational hygienists (OH) act important rolls to perform risk assessment including hazard control and exposure assessment. In Japan, however, IH or OH is not well recognized, and such specialists are so few that above sampling method is difficult to introduce in the workplaces. The working environment measurement in the designated workplaces must be conducted by the Working Environment Measurement Experts (WEMEs), who are experts on design, sampling, analysis and evaluation of the working environments. WEMEs can evaluate environmental conditions of workplaces exactly, but risk assessment is not their work. Occupational physicians are specialists on occupational health, but they do not have technical skills on the work environment control. Health managers can design improvement of working environment, but working environment measurement is not their work.

Because Japanese work environment control system based on the working environment measurement are systematically performed even if knowledge of risk assessment is insufficient, IH or OH has not always been necessary. Working environment measurement is an ef-

fective tool for improving working environments because the points to be improved can be found out easily, so that countermeasures are easily carried out. As a result, recently, greater than 90% of workplaces are classified as control class[1)], that is, good condition, and the measured values are often lower than the detection limits. In such cases, periodical measurement may not be effective and cost benefit is low. On the other hand, working environment measurement by law is not enough for work environment control of workplaces using hazardous chemicals. In Japan, more than 60,000 chemicals are utilized and more than 1,000 chemicals are newly introduced in the industry[1)]. Most of them are non-designated chemicals so that measurements are not obliged even hazardous materials are generated. Therefore, actual state of environments and exposure levels in such workplaces are hardly known.

To advance more effective work environment control, risk assessment by enterprises should be carried out. To perform this, exposure assessment is necessary. The Ministry of Health, Labor and Welfare, Japan, is now planning to introduce personal monitoring as well as conventional working environment measurement. This is an epoch-making policy, but several problems exist. The most important problem is lack of specialists in occupational hygiene such as OH. The Japan Association of Working Environment Measurement has started training course of OH since 2010, and the certification in OH has been given to the trainees who passed examination[7)], but number of certified OH is so small that they cannot fulfill needs. Moreover, in many countries, basic education and training of IH/OH are mainly provided by graduate school in universities[8–15)], but in Japan, there is no university with graduate school of OH program. University of Occupational and Environmental Health, Japan, is now preparing to open a graduate school with OH program. In order to develop OH system in Japan, not only training OH specialist but also changing administrative policy or paradigm on occupational hygiene that enlarges discretion of enterprises is necessary. By preparing these circumstances, more effective work environment control for reducing risk by self-management is expected.

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