Occupational Safety and Health
and
The role of experts in Japan

2010.1.28
• Japan Association of Working Environment Measurement
  Tokyo, JAPAN
Topics

1. Outline of Occupational Safety and Health in Japan

2. Occupational Health and the role of Experts
Change in Number of Deaths by Industrial Accidents in All Industries (Year 1953~2006)
1 Regulation of OSH in Japan

Labor Standards Law of 1947

Pneumoconiosis prevention Law of 1960

Industrial Accidents Prevention Organizations Law of 1964

Industrial Safety and Health Law of 1972

Working Environment Measurement Law of 1975
2 Regulatory framework of OSH

**Industrial Safety and Health (ISH) Law of 1972**

- **Cabinet order** of ISH-Law

- **Ordinances on safety/health**
  - Ordinances on ISH
  - 3 Ordinances relating to industrial safety
  - 10 Ordinances relating to occupational health

- **<minister’s notifications>**
  - Examples;
    - Construction codes on boiler, crane, etc.
    - Guidelines on OSHMS
    - Guidelines on labeling of chemicals
    - Guidelines on risk assessment

- **<administrative notifications>**
10 Ordinances under ISH-Law relating to Occupational Health

(1) Ordinance of Prevention of Organic solvent poisoning
(2) Lead poisoning
(3) Tetra-alkyl lead poisoning
(4) Hazards due to Specified chemicals such as suspected carcinogens
(5) Hazards due to Asbestos
(6) Hazards due to Work under High pressure
(7) Hazards due to Dusts
(8) Hazards due to Ionizing radiation
(9) Prevention of Anoxia
(10) Health standards in the offices
3 Implementing system of OSH

< Central Government > = implementation of laws, inspection, guidance & assistance, etc.,

- MHLW (Ministry of Health, Labor and Welfare)

< Branch / Local System >
- Prefectural Labor Standard Bureau (47)
- Labor Standard Inspection Office (343)

< Management & Labor >
- Japan Business Federation (Nippon Keidanren)
- Japan Trade Unions’ Confederation (Rengo)
3 Implementing system of OSH (2)

<Related Organizations>

/ Employers’ Accidents Prevention Associations
- Japan Industrial Safety and Health Association (JISHA)
- 5 Associations for Respective Industries
  - Construction
  - Land cargo transportation
  - Marine cargo transportation and stevedore
  - Timber manufacturing and forestry
  - Mining
- Local Branch of above associations (47 each)

/ OSH Institutions for
  Safety/Health Qualification Examinations,
  Safety/Health Educations,
  Work-environment Measurements,
  Medical examination and others
3 Implementing system of OSH (3)

MHLW and its local offices

Employers’ Accident Prevention Associations (JISHA and 5 associations)

Subsidy in personnel expenses

Sponsoring fully

Research arm (National Institute of Occupational Safety and Health Japan=JNIOSH)

Public Associations whose duty is delegated by MHLW (‡ Working Environment Measurements (JAWE), ‡ Consulting (Japan Industrial Safety & Health Consultants Association), ‡ Qualification exams (Japan Association of Qualification Examinations))

Public Associations engaged in business registered to MHLW (inspection of boiler, crane, elevator, etc., examination of respirators, helmets, etc.,)
4 Present OSH Situation in Japan

(1) Change in Industry, Work structure and Workplaces

Change in Industry, Work structure

- Increase of Tertiary industry
- Increase of peripheral workers
- Increase of aged workers due to higher retirement age and lower birth rate
- Increasing trend of women workers
Workplace Changes

- More diversified and complicated industrial processes
  - Introducing new machinery, equipment and raw materials, chemicals
    - Diversified risks of labor accidents

- Collective retirement of baby boomers from workplaces and Increasing peripheral workers
  - Fear of inadequate transfer of know-how of safety and health
to disseminate /promote the method of risk assessment among workplaces and lower the risk through the practice of it

To specify, through accidents analysis etc., dangerous jobs, operations, machinery etc., that can be the major cause of accidents or have high risk inherently and establish/take effective measures to prevent accidents due to them
<Especially as for Chemicals>

- Promotion of Hazard identification of chemicals as well as Risk assessment of chemical processes by the best use of
  - Materials Safety Data Sheets (MSDS) prepared according to GHS.
  - Exposure analysis
  - Indices such as OEL
Occupational Health Experts
under
Industrial Safety and Health Law

- Industrial Safety and Health Consultants (1972)
  - Industrial Safety Consultant
  - Industrial Health Consultant

- Working Environment Measurement Experts (1975)
  - Working Environment Measurement Expert of 1st kind
    - entitled to Design, Sampling and Analysis (fully)
  - Working Environment Measurement Expert of 2nd kind
    - entitled to Design, Sampling and analysis (by simple methods only)
1 Industrial Safety Consultant

<Qualification for examination>

- graduates of university/college +5 years’ experience of safety
- graduates of junior college/technical college +7 years’ experience of safety
- graduates of high school +10 years’ experience of safety,
- and others
Industrial Safety Consultants (1972)

<Methods of Examination>
  written examination and oral examination

<Division of Examination>
  • Machinery Safety
  • Electricity Safety
  • Chemical Safety
  • Civil engineering Safety
  • Construction Safety
<Methods of Examination>
  written examination and oral examination
<Division of Examination>
  • Health
  • Industrial hygiene engineering
Industrial Safety and Health Consultants (1972)

- How to become a consultant

  1\textsuperscript{st} step: to pass examination (written, oral) by Designated Consultant Examination Institution

  2\textsuperscript{nd} step: to be registered in the industrial safety consultant registry of Designated Consultant Registry Institution
The Role of Consultants

Introducing OSHMS

Risk Assessment of Chemicals, Machinery, etc.,

Preparing OSH codes, work standards, related papers to

Investigation of cause of labor accident

OSH Education

Improvement/renovation of work practice, local exhaust ventilation, PPE,
Japan Association of Safety and Health Consultants (JASHCON)

- Founded in 1983 as a public corporation with members of Industrial Safety and Health Consultants and other supporting members
- Headquarter and 47 branches (each prefecture)
- Duty/business
  - Various kinds of OSH Education and training
  - OSHMS auditor/inspector training
  - Lifelong education program (2004~)
### Number of consultants (8,199)

<table>
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<th>Service Category</th>
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<td>Machinery Safety</td>
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<tr>
<td>Electricity Safety</td>
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<tr>
<td>Chemical Safety</td>
<td>317</td>
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<td>Civil engineering Safety</td>
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<td>Health</td>
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</table>
Working Environment Measurement Experts (1975)

- Working Environment Measurement Expert of 1st kind
  - entitled to Design, Sampling and Analysis (fully)

- Working Environment Measurement Expert of 2nd kind
  - entitled to Design, Sampling and Analysis (by simple methods only)
The “working environment measurement” by law consists of (1) design, (2) sampling and (3) analysis.

“Design” is particularly important so that the result of the statistical treatment of figures obtained from each sampling point rightly reflect the actual state of airborne concentration of chemicals.

The method of “Design” is stipulated by Minister’s Notice entitled “Working Environment Measurement Standards”
According to the notice, the “design” and “sampling” should follow the below;

(1) Vertical and horizontal lines are drawn at equal intervals of not more than 6 m on the floor of a unit work area (refers to such a necessary section that is designated for working environment based on the condition of distribution of harmful substances and range of movement of workers within the area of a workshop concerned, hereinafter the same shall apply) and a sampling point is provided at each intersection of those lines at a position 50 to 150 cm above the floor (except such a point where measurement is very difficult due to equipment etc.). However, when it is obvious that the concentration of chemicals/dusts is substantially uniform, vertical and horizontal lines can be drawn at equal intervals of more than 6 m on the floor of a unit work area and a sampling point provided at each intersection of those lines.
(2) Sampling points shall be provided at not less than 5 points though when they become less than 5 points then the above rule is applied regardless of the provisions of the preceding item. However, when the unit work area is very narrow and it is obvious that the concentration of chemicals/dust is substantially uniform, the number of sampling points may be less than 5.

(3) The measurement prescribed in the preceding section shall be made at such time when work is regularly performed.
Working Environment Measurement Expert

Airborne Concentration

- Mineral dust
- Organic solvents
- Specified metals
- Specified chemicals
- Radioactive materials
Steps of Working Environment Measurement

1. Determination of unit workplace
2. Setting date & time
3. Determining measurement condition
4. Determining measuring points

A-measurement
- Calculation of geometrical means, standard deviation

B-measurement
- Determination of Class 1, 2, 3

Design

Sampling / analysis

Statistical treatment
definition

1st Evaluation Value (Ea1)
Estimated value suited to 5% from the highest level among the actual value of airborne toxic substances at working hours at all possible points in a unit work area.

2nd Evaluation Value (Ea2)
Estimated value of the arithmetic mean concentration of airborne toxic substances in a unit work area.
Control Class □

< condition of working area >
Concentration of airborne hazardous chemical does not exceed the administrative control level at almost (more than 95%)points.

< measures to be taken >
Nothing to be taken. To continue the current working environment control to keep the present condition
Control Class

< condition of working area >

Mean concentration of airborne hazardous chemical does not exceed the administrative control level.

< measures to be taken >

Try to take necessary measures, based on the result of inspection of facilities, equipment, operation or work procedure.
Control Class Ⅱ

< condition of working area >
Mean concentration of airborne hazardous chemical exceed the administrative control level.

< measures to be taken >
・Take necessary measures, as soon as possible, based on the result of inspection of facilities, equipment, operation or work procedure
・Use effective respirator, if necessary.
・carry out medical examination or other measures, if necessary.
Classification of control class (1)
“A-sampling only” case

<table>
<thead>
<tr>
<th>Ea&lt;E</th>
<th>Ea1 &lt; E &lt; Ea2</th>
<th>Ea2 &gt; E</th>
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<tbody>
<tr>
<td>Class</td>
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## Classification of control class (2)

Both “A-sampling” and “B-sampling” case

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<th>$E_{a1} \leq E \leq E_{a2}$</th>
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<tr>
<td>$CB &gt; 1.5 \leq E$</td>
<td>Class</td>
<td>Class</td>
<td>Class</td>
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Characteristics of Japanese Working environment measurement

- **measurement** of the airborne concentration of chemicals/mineral dusts/asbestos fibers, etc., in the workplace atmosphere

- **statistical treatment** of the measurements results to calculate geometrical mean value and geometrical standard deviation
- to calculate indices to be compared with “control levels” that are values stipulated for each hazardous chemicals by the government
- **comparison** between “indices” and “control levels”
  - determination of “which Class ‡T, ‡U or ‡V the workplace falls”

  - if Class ‡T the workplace condition is good and no action is needed
  - if Class ‡U the workplace condition needs improvement to realize Class ‡T
  - if Class ‡U the workplace condition is between Class ‡T and ‡U it is encouraged to realize Class ‡T by checking the workplace condition and taking necessary action
Comparison of Japanese method with those of US/European method

- **Japanese methods**
  - measuring airborne concentration without regards, principally, to workers exposure concentration
  - the result is used for evaluation of workplace conditions as to whether any action for improvement is needed or not.
  - *main purpose* → to lead to working environment improvement

- **US and most European countries’ method**
  - measuring workers’ exposure to chemicals
  - in terms of 8 hours’ time weighted average
  - compare results with “Occupational Exposure Limits (OEL)” or respective chemicals
  - OELs are recommended from some of the institutions such as TLVs from ACGIH.
  - *main purpose* → to evaluate workers’ exposure rather as a means of health control than that of working environment control
The merit of Japanese measurement system

- better practicality/feasibility for employers to make measurements
  - measuring airborne concentration is easier than measuring exposure of each worker

- closer connections between results of measurement and the identification of the facility/equipment that needs improvement
Japan Working Environment Measurement Association (JAWA)

- Founded in 1954 as a public corporation with members of Working Environment Measurement (WEM) Experts as well as organizations and other supporting members
- Headquarter and 13 branches covering all Japan
- Duty/business
  - Skill training course stipulated by law for candidate of WEM Experts who have passed authorised qualification examination
  - Various kinds of Education and training for WEM Experts
  - Special courses for WEM Experts to become possible
  - Occupational Hygienists accredited by JAWA
### Number of WEM Experts (plural counts.)

<table>
<thead>
<tr>
<th>Kind</th>
<th>Description</th>
<th>Number</th>
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<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; kind</td>
<td>(design, sampling and analysis for Mineral Dust)</td>
<td>9,581</td>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; kind</td>
<td>(design, sampling and analysis for radioactive material)</td>
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<td>(design, sampling and analysis for specified Metal)</td>
<td>6,145</td>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; kind</td>
<td>(design, sampling and analysis for Organic Solvents)</td>
<td>13,258</td>
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<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; kind</td>
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<td>5,771</td>
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Thanks for your attention!