

**Special Article**

# Occupational Health Policies on Risk Assessment in Japan

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Industrial Safety and Health Law (ISH Law) of Japan requires abnormalities identified in evaluations of worker health and working environments are reported to occupational physicians, and employers are advised of measures to ensure appropriate accommodations in working environments and work procedures. Since the 1980s, notions of a risk assessment and occupational safety and health management system were expected to further prevent industrial accidents. In 2005, ISH Law stipulated workplace risk assessment using the wording "employers shall endeavor." Following the amendment, multiple documents and guidelines for risk assessment for different work procedures were developed. They require ISH Laws to be implemented fully and workplaces to plan and execute measures to reduce risks, ranking them from those addressing potential hazards to those requiring workers to wear protective articles. A governmental survey in 2005 found the performance of risk assessment was 20.4% and common reasons for not implementing risk assessments were lack of adequate personnel or knowledge. ISH Law specifies criminal penalties for both individuals and organizations. Moreover, under the Labor Contract Law promulgated in 2007, employers are obliged to make reasonable efforts to ensure employee health for foreseeable and avoidable risks. Therefore, enterprises neglecting even the non-binding provisions of guidelines are likely to suffer significant business impact if judged to be responsible for industrial accidents or occupational disease. To promote risk assessment, we must strengthen technical, financial, and physical support from public-service organizations, encourage the dissemination of good practices to reduce risks, and consider additional employer incentives, including relaxed mandatory regulations.

**Key Words:** Occupational health services, Health policy, Risk assessment, Risk management, Occupational health and safety management system

## Introduction

An occupational safety and health risk assessment is widely-accepted as the powerful notion expected to drive employers and employees toward voluntary actions for the prevention of occupational diseases and industrial accidents. The idea

originated from Report of the Robens Committee in UK. This report elucidated the defects of the statutory system by pointing out if there are too many laws and regulations they cannot be appropriately cared or revised all the time when new technical and scientific developments take places. It also indicated restrictive legislation might not generate better and appropriate standards. Moreover, it eloquently motivated both employers and employees to participate in preventive activities by saying that those who create the risks are primarily responsible. These recommendations in 1972 were reflected in the Health and Safety at Work etc Act in 1974 in UK and it asks all workplaces to set up their code of practice to reduce evaluated risk to the level so far as reasonably practicable.

**Received:** August 6, 2010, **Accepted:** August 27, 2010

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In Japan, since the beginning of Meiji era, its legal system has been modernized by transplanting civil law from European countries mainly from Germany and France. As a result, the a law-abiding society was established, featured with making decision based on written and codified documents and not on judgment of judicial authorities such as in UK and USA where common law has been traditionally prevailed. Right after the Second World War, Japanese constitution underwent major revision influenced by USA, however, legislative and judicial system have remained to follow continental law. Therefore, Industrial Safety and Health Law (ISH Law) of Japan continues to designate dangerous or hazardous work, clearly stipulate minimum standards, and prescribe penalties, that is, directly require risk reduction measures irrelevant to evaluated risk at each workplaces. It is a common belief that this law has been valid and successful as their occupational accident rate dropped dramatically until 1980's.

Since late 1990's, Japanese business and social system has been confronted with significant reform for the future, influenced with fierce competition in overseas market, sluggish economy, and aging workforce. Around the same time, working patterns have been widely diversified including increase in temporary, part-time, and mobile workers, and production processes have become more complicated such as increase in use of new machinery, equipment and chemical substances. These situations often generate nonregulated, unexpected, and newly hazardous and harmful circumstances to workers. During those days, occupational safety and health experts in Japan gradually realized the necessity of promoting voluntary measures to systematically reduce risks in the workplace for the further prevention of occupational accidents in recent years. It may be said Japanese occupational safety and health policymakers are now struggling to accommodate law-abiding system and self-regulating system.

## Occupational Health Laws in Japan

Since the enactment of the Factory Law in 1911, one provision of which compelled factory owners to prevent work by workers with contagious diseases, occupational health laws in Japan have emphasized employer control of employee health. In 1938, an amended stipulation mandated annual health examinations of workers to control tuberculosis. In 1947, the Labour Standard Law that went into effect alongside the new constitution expanded similar requirements to all industrial sectors. Health assessment policies have continued to develop since then, and various types of work-specific reviews of potential hazards have been introduced. From the

early stages, policy makers already had the idea of evaluating working environments for selecting workers for those specific examinations, however, technical obstacles remained to compelling employers to implement workplace monitoring.

In 1972, upon the establishment of ISH Law distinct from Labour Standard Law, occupational health laws in Japan added the new mandatory stipulation of monitoring working environments. Governmental bulletins concerning technical guidelines for assessments were introduced in 1976 and those for evaluations in 1988. Around this time, a dual system for evaluating worker health and working environments became an established component of Japanese occupational health policies. Abnormalities identified in either type of evaluation are now reported to occupational physicians assigned to the workplace, and employers are advised of measures to ensure appropriate accommodations in working environments and work procedures [1].

## Legislative Stipulations on Risk Assessments at Workplaces in Japan

Since the 1980s, the government of Japan and organizations such as the Japanese Standards Association (JSA), the Japan Industrial Safety and Health Association (JISHA), and the Japan Association of Safety and Health Consultants (JASHC) have repeatedly organized committees or working groups to form advisory panels composed of professionals, service providers, academics, lawyers, and government officers to review and discuss international movements and their efficacy in encouraging voluntary actions of enterprises to promote occupational health and safety (Table 1) [2-7]. In these committees, notions of a risk assessment and occupational health and safety management system (OHSMS) were admitted as promising policies and expected to further reduce the incidence rate of industrial accidents and occupational diseases. To disseminate these ideas throughout Japanese society, definitions and translations of English terms such as "hazard," "risk," "estimation," and "assessment" were repeatedly discussed and confirmed. Since health and safety are regarded as different issues in most Japanese legislation, "danger" and "harm" are generally regarded to correspond, respectively, to "safety" and "health".

As early as 1976, the Labour Standard Bureau of the Ministry of Labour, issued official notifications that used the term "safety assessment" as part of efforts to prevent accidents in chemical plants, even incidents believed to occur only rarely. In 1999, when ILO began preparing guidelines on occupational safety and health management system (OSHMS), then-

**Table 1.** Lists of the documents used to develop Japanese policy for workplace risk assessments

- 1) Occupational Health and Safety Management System (OHSMS)
  - Occupational Safety and Health Management System (OSHMS), ILO
  - Occupational Health and Safety Assessment Series (OHSAS) 18001, BSI
  - Occupational Health and Safety Management System (OHSMS), ISO/TMB
- 2) Comprehensive safety standards of machinery
  - Introduction of measures to encourage improvements in the safety and health of workers (Framework Directive, Directive 89/391/EEC), EEC
  - Safety aspects - Guidelines for inclusion in standards (ISO/IEC Guide 51), ISO/IEC
  - Safety of machinery - Basic concepts, general principles for design (ISO/TR 12100), ISO/IEC
  - Safety of machinery - Principles for risk assessment (ISO14121/EN1050), ISO/CEN
- 3) Workplace risk assessments
  - Guidance on risk assessment at work, EC
  - Management of Health and Safety at Work Regulations (MHSWR), UK
  - Five steps to risk assessment, UK HSE
  - As Low As Reasonably Practicable (ALARP), UK HSE
  - Reducing Risks, Protecting People (R2P2), UK HSE
  - Voluntary Protection Program (VPP), US OSHA
  - Job Hazard Analysis (JHA), US OSHA
- 4) Risk assessments related to Chemicals
  - Globally Harmonized System of Classification and Labelling of Chemicals (GHS), UN
  - Stockholm Convention on Persistent Organic Pollutants (POPs), UNEP
  - Rotterdam convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade, UNEP, FAO
  - Strategic Approach to International Chemicals Management (SAICM), UNEP
  - Agenda 21, UNDSO
  - Commission on Sustainable Development (CSD), UNDSO
  - Registration, Evaluation, Authorisation and Restriction of Chemical substances (REACH), EU
  - Control of Substances Hazardous to Health (COSHH), UK HSE
  - Control Banding (COSHH Essentials), UK HSE

BSI: British Standards Institution, CEN: European Committee for Standardization, EC: European Commission, EEC: European Economic Community, EU: European Union, FAO: Food and Agriculture Organization, HSE: Health and Safety Executive, ILO: International Labour Organization, IEC: International Electrotechnical Commission, ISO/TMB: International Organization for Standardization/ Technical Management Board, OSHA: Occupational Safety and Health Administration, UNDSO: United Nations Division for Sustainable Development (DSD), UNEP: United Nations Environment Program.

Ministry of Labour issued official notification on OSHMS and started a campaign to disseminate its notion (Table 2). In 2003, JISHA started their accreditation program for an OSHMS, which is characterized by not simply evaluating but providing practical advice for further improvements from experienced inspectors and by evaluating employer efforts in the areas of

worker health management and health promotion activities [8,9].

In November 2003, MHLW undertook a survey targeting large manufacturers with 500 or more employees and found differences in mean incidence rates of industrial accidents per 1,000 workers based on the status of voluntary actions: 3.91

**Table 2.** Guidelines announced by the government on risk assessments in Japan

1) Guidelines for risk assessment
LSB notification No. 0310001, March 10, 2006
MHLW notification No.1, guidelines for risk assessments, March 10, 2006
2) Guidelines for risk assessments related to chemicals
LSB notification No. 0330001, March 30, 2006
MHLW notification No.2, guidelines for risk assessments, March 30, 2006
3) Guidelines on Occupational Safety and Health Management System (OSHMS)
MHLW notification No.113, March 10, 2006
MOL notification No.53, April 30, 1999
4) Guidelines for Material Safety Data Sheet (MSDS)
MOL notification No.120, December 25, 2000
MOL notification No.60, July 1, 1990
5) Guidelines for the comprehensive safety standards of machinery
LSB notification No.731001, July 31, 2007
LSB notification No.501, No.501-2, June 1, 2001
6) Guidelines for the safety assessment of chemical plants
LSB notification No.149, March 21, 2000
LSB notification No.905, December 24, 1976

LSB: Labour Standard Bureau, MHLW: Ministry of Health, Labour, and Welfare, MOL: Ministry of Labour.

at workplaces implementing OSHMS (14.7%), 4.00 at those implementing only risk assessments (12.3%), 4.21 at those developing OSHMS (7.2%), and 6.15 at other workplaces (65.7%) [10]. In 2005, a periodic survey by MHLW shows that of the 7.3% of all workplaces where OSHMS was already implemented, 86.7% had experienced reductions in serious work incidents (Table 3) [11]. These cross-sectional survey results formed the rationale for pushing forward the legalization of risk assessment provisions.

In the process of drafting amendments of the ISH Law to incorporate these voluntary actions, discussions addressed the need for radical transformations to promote movements on risk assessment that is, large-scale exemptions from specific stipulations [12]. However, given the importance of preserving order in legislative function and the current system of labor standard inspections, the decision was made to compile requirements

**Table 3.** Implementation of OSHMS and experience of potentially grave incidents

Size or sector of workplace	Implementation of OSHMS (%)	Experience of potentially grave incidents decreasing (%)	Not decreasing (%)
1,000-	[37.2] 100.0	61.5	38.5
500-999	[23.3] 100.0	64.6	35.4
300-499	[18.9] 100.0	79.1	20.9
100-299	[12.5] 100.0	69.1	30.9
50-99	[9.9] 100.0	90.0	10.0
30-49	[6.9] 100.0	89.7	10.3
10-29	[6.4] 100.0	88.9	11.1
Construction	[19.1] 100.0	77.5	22.5
Manufacturing	[6.0] 100.0	88.1	11.9
Electricity, gas, heat, or water supply	[35.4] 100.0	77.1	22.9
Information and telecommunications	[4.1] 100.0	63.4	36.6
Transportation	[9.8] 100.0	79.8	20.2
Sales and retail	[4.3] 100.0	99.1	0.9
Restaurants and hotels	[3.6] 100.0	96.1	3.9
Other services	[6.6] 100.0	94.1	5.9
Total	[7.3] 100.0	86.7	13.3

Source: Basic Survey on Industrial Safety and Health, 2005 [11].

and recommendations together into the ISH Law. The need for other types of incentives for employers was pointed out, including reducing premiums for workers' compensation insurance or certification programs. Finally, a decision was made to allow an exemption from the stipulation requiring notification to be sent to a government office.

On November 2, 2005, when ISH Law was amended to launch a new policy on face-to-face guidance by physicians for workers working long hours, another new policy on workplace risk assessments was stipulated to facilitate voluntary actions by employers. This law went into effect on April 1, 2006. Article 28-2 recommended risk assessments using the wording "shall endeavor"; Article 88 is the only sentence stipulating incentives for employers to promote risk assessments.

**Table 4.** Titles of documents, textbooks, pamphlets, and leaflets on risk assessments published by public organizations in Japan

## 1) Ministry of Health, Labour, and Welfare (MHLW)

- Risk assessment at building maintenance work-targeting zero accidents, March 2009
- Method for promoting risk assessments in assembly work, March 2009
- Method for promoting risk assessments in shape forming work, March 2009
- Method for promoting risk assessments in welding work, March 2009
- Method for promoting risk assessments in plating work, March 2009
- Method for promoting risk assessments in heat treating work, March 2009
- Method for promoting risk assessments in painting work, March 2009
- Prevention of industrial accidents- assurance of health and safety of workers is the responsibility of company, December 2008
- Method for promoting risk assessments in metal processing work, March 2008
- Method for promoting risk assessments in wood processing work, March 2008
- Method for promoting risk assessments in printing/bookbinding work, March 2008
- Guidelines for comprehensive safety standards of machinery, July 2007
- Method for promoting risk assessment of chemical substances, noise, and heat in casting manufacturing industry, March 2007
- Accreditation program of exemption from notification to labour standard office, March 2006
- Guidelines for risk assessments related to chemicals, March 2006
- Guidelines for risk assessments, March 2006

## 2) Japan Industrial Safety and Health Association (JISHA)

- Risk assessment for health supervisors, May 2010
- Good practices on risk assessment of chemical substances, March 2009
- Method for promoting risk assessments related to chemicals to prevent health impairments, March 2009
- Manual on risk assessments in the building maintenance industry, October, 2008
- Manual on risk assessments in the waste management industry, March 2008
- Manual on risk assessments in the industrial waste management industry, February 2008
- Risk assessments in the industrial waste management industry- targeting zero accidents, November 2007
- Method for promoting risk assessments in metal-stamping work- targeting introduction at small and medium size workplaces, March 2007
- Manual on risk assessments in the casting manufacturing industry- targeting introduction at small and medium size workplaces, March 2007
- Good practices for the formulation of occupational safety and health management system; vol.1, March 2002; vol.2, March 2003; vol.3, March 2004; vol.4, March 2005; vol.5, March 2006; vol.6, March 2007
- Learning from cases of workplace risk assessments- including method for implementing risk assessment at small workplaces, March 2007
- Good practices for risk assessments for machinery and efforts by manufacturers and users; vol.1, March 2005; vol.2, March 2006; vol.3, March 2007
- Introductory manual on risk assessment at metal-stamping workplaces, March 2006
- Occupational safety and health management system- to promote effective systems, March 2006
- Occupational safety and health management system- for the framework of systematic, continual, and forward-looking health and safety management, March 2005
- Occupational safety and health management system- anticipated results, March 2004

**Table 4. Continued**

## 3) Construction Industry Safety and Health Association (CISHA)

Guidelines on Occupational Health and Safety Management System (COHSMS); June 2006

Specific standard model for hazard identification for formwork insulation, March 2004

Specific standard model for hazard identification for reinforcement placing, March 2004

Specific standard model for hazard identification for electrical engineering, March 2004

Specific standard model for hazard identification for plumbing heating and air-conditioning, March 2004

## 4) Forestry and Timber Manufacturing Safety and Health Association (FTMSHA)

Let's get started with risk assessments, timber yarding with Swing Yarder, June 2008

Let's get started with risk assessments, anticipating hazards and nipping disasters in the bud, logging and timber processing, August 2007

Let's promote risk assessments, timber manufacturing, March 2006

Let's promote risk assessments, March 2006

## 5) Japan Association of Safety and Health Consultants (JASHC)

Method of promoting risk assessments in cargo handling operations in the transportation industry, March 2007

Method to promote risk assessment-oriented behaviors in retail distribution industry- for the implementation of risk assessment at retail shops, March 2007

**Article 28-2**

- 1) The employer shall endeavor to investigate potential danger or harm posed by buildings, facilities, raw materials, gases, mist, dust, etc., or danger or harm arising from work actions and other duties, and to take necessary measures prevent workplace hazards or worker health impairment, in addition to taking measures provided for under provisions pursuant to this Act or orders based on the results of said investigations.
- 2) The Minister of Health, Labor and Welfare shall give special consideration to middle-aged and elderly workers in preparing the technical guidelines specified in the preceding paragraph.

**Article 88**

- 1) When seeking to construct, install, move, or alter the main structure of the buildings or machines, etc. pertaining to the said workplace, the employer shall send the plan to the Chief of the Labor Standards Office no later than 30 days prior to the date of commencement of said work. However this provision shall not apply to employers acknowledged by the Chief of the Labor Standards Office as taking the measures specified in paragraph (1) of Article 28-2.

**Guidelines for Risk Assessments at Workplaces in Japan**

Following the amendment, multiple documents, textbooks, pamphlets, and leaflets on commentaries, on exemplary practices, and on guidelines explaining detailed procedures for risk assessment for different work procedures were developed (Table 4) [13,14]. Guidelines for the Comprehensive Safety Standards of Machinery is divided into action items recommended to manufactures and those to users of machinery [15]. Two main guidelines of Guidelines for Risk Assessments and Guidelines for Risk Assessments related to Chemicals, both announced based on paragraph (2) of Article 28-2 of ISH Law, involve purpose, scope, implementation items, organizational structure, implementation timing, identification of hazards, determination of risk assessments and control measures, information gathering, identification of hazards, risk estimation, study and implementation of risk reduction measures, and record-keeping [16]. These guidelines are designed to address the portion of risk assessments addressed in the Guidelines on OSHMS. They define risk assessment as covering the identification of hazards related to jobs undertaken by workers; risk estimation; setting priorities to reduce the risks estimated; examining risk reduction measures;

**Table 5.** Classification of hazards in guidelines for risk assessment

<p>I. Danger</p> <ol style="list-style-type: none"> <li>1. Danger on machines</li> <li>2. Danger on substances               <ol style="list-style-type: none"> <li>1) Explosive substances</li> <li>2) Ignitable substances</li> <li>3) Inflammable substances</li> <li>4) Miscellaneous dangerous substances, including oxidizing substances, combustible gas, dust, corrosive liquids, etc.</li> </ol> </li> <li>3. Danger on energy or status               <ol style="list-style-type: none"> <li>1) Electricity</li> <li>2) Heat</li> <li>3) Miscellaneous energy, including light wave, shock wave, etc.</li> </ol> </li> <li>4. Danger on work               <ol style="list-style-type: none"> <li>1) Excavation</li> <li>2) Quarrying</li> <li>3) Cargo handling</li> <li>4) Logging</li> <li>5) Miscellaneous works, including steel framing, etc.</li> </ol> </li> <li>5. Danger related to place of work               <ol style="list-style-type: none"> <li>1) Falling</li> <li>2) Mudslides</li> <li>3) Slipping</li> <li>4) Stumbling</li> <li>5) Lighting and illumination</li> <li>6) Miscellaneous hazardous areas</li> </ol> </li> <li>6. Danger related to work behavior</li> <li>7. Danger outside the workplace</li> </ol>	<p>II. Harm</p> <ol style="list-style-type: none"> <li>1. Harm on substances               <ol style="list-style-type: none"> <li>1) Materials</li> <li>2) Gas</li> <li>3) Mist</li> <li>4) Dust</li> <li>5) Anoxic air</li> <li>6) Microorganisms</li> <li>7) Miscellaneous, including exhaust air, drain fluid, sludge</li> </ol> </li> <li>2. Harm on energy or operating status               <ol style="list-style-type: none"> <li>1) Radiation</li> <li>2) High temperature</li> <li>3) Low temperature</li> <li>4) Ultrasound</li> <li>5) Noise</li> <li>6) Vibration</li> <li>7) Abnormal pressure</li> <li>8) Miscellaneous, including infrared, ultraviolet, laser, etc.</li> </ol> </li> <li>3. Harm on work               <ol style="list-style-type: none"> <li>1) Instrument surveillance</li> <li>2) Precision processing</li> <li>3) Miscellaneous harm on work behavior</li> </ol> </li> <li>4. Miscellaneous harm</li> </ol> <p>III. Additive effects to danger or harm</p> <ol style="list-style-type: none"> <li>1) Cumulative fatigue</li> <li>2) Work at night</li> <li>3) Extended work times</li> </ol>
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and implementing risk reduction measures in accordance with the priorities set. The notion of hazard is subdivided into danger, harm, and additive factors (Table 5), since human factors such as the subjective sense of fatigue affected by work schedule are regarded as health risks. The guidelines urge the participation of a lead manager to supervise overall business undertaking, safety supervisors and health supervisors as specified in ISH Law, worker representatives, individuals familiar with specific work details, such as a foreman, and individuals who have technical knowledge regarding the relevant machinery or equipment. Risk assessments are recommended to be repeated whenever a structure, a facility, a piece of machinery

or equipment, a raw material, or a working method is newly adopted, modified, or changed, or when risks perceived in a workplace change, such as upon the occurrence of an industrial accident, change in quality of machinery, passage of a long time period, or application of new health and safety expertise, etc.

According to the guidelines, risk estimates should reflect the severity and the likelihood of the occurrence of injuries or diseases due to hazards or the toxicity of and extent of exposure to chemical substances [17]. Risks should then be estimated by comparing measurement results to exposure limits for the relevant chemical substance or physical factor (such

as the occupational exposure limits (OELs) published by the Japan Society for Occupational Health), as well as the potential for disease after long-term exposure; the properties of the relevant chemical substance, production or handling volumes, detailed work and production methods, working conditions, personnel assignments, working hours, etc. The guidelines introduce various facile methods for risk estimation such as

concise matrix methods, branching diagrams, and numerical rating scales [18-21]. They also ask to identify the individuals at risk, to assume the most serious injuries or diseases possible, and to quantify severity by the number of workdays missed. The guidelines require ISH Laws to be implemented fully and workplaces to plan and execute measures to reduce risks, ranking them from those addressing potential hazards to those re-

**Table 6.** Priority of risk reductions in guidelines for risk assessment

- 1) Measures to reduce or eliminate hazards starting with the design and planning stage, such as the elimination or changes in hazardous work, cessation of the use of high-hazard chemical substances, or replacement with lower-hazard materials
- 2) Reductions in the extent of the potential for diseases or level of exposure; for example, by changing operating conditions involving reaction processes and formation of chemicals
- 3) Engineering measures such as the adoption of explosion-proof structures, machinery and equipment enclosures, installation of interlocks and local exhaust systems, etc.
- 4) Administrative measures, such as the preparation of instruction manuals
- 5) Use of personal protective equipment

**Table 7.** Implementation of follow-ups after workplace risk assessments

Size or sector of workplace	Implementation of risk assessment (%)	Follow-up after risk assessment (%)					
		a	b	c	d	e	f
1,000-	[69.5] 100.0	10.4	56.9	58.4	66.9	64.6	13.5
500-999	[49.4] 100.0	17.6	52.7	56.7	66.7	66.7	7.1
300-499	[34.1] 100.0	13.3	42.1	65.6	68.5	65.2	9.5
100-299	[23.9] 100.0	11.4	36.2	53.2	59.5	57.0	7.4
50-99	[26.6] 100.0	15.4	24.3	55.1	51.1	53.4	8.0
30-49	[19.3] 100.0	11.6	20.7	44.2	31.7	59.8	8.2
10-29	[19.3] 100.0	14.5	14.1	43.0	13.5	34.1	22.4
Construction	[23.3] 100.0	11.3	29.8	53.1	30.1	37.7	14.2
Manufacturing	[22.2] 100.0	8.9	21.9	52.7	33.5	46.9	16.6
Electricity, gas, heat or water supply	[41.2] 100.0	9.1	48.5	68.2	41.1	51.4	13.3
Information and telecommunications	[9.3] 100.0	27.9	39.5	55.3	25.8	35.6	17.7
Transportation	[32.8] 100.0	8.5	16.3	38.9	41.1	47.0	22.5
Sales and retail	[18.8] 100.0	20.8	7.2	42.5	12.7	39.7	15.9
Restaurants and hotels	[10.5] 100.0	28.7	30.0	15.9	11.4	25.8	38.0
Other services	[18.6] 100.0	7.2	23.5	49.3	17.4	46.3	13.4
Total	[20.4] 100.0	14.0	18.3	45.5	24.4	42.1	17.5

a: shows results of risk assessments to an external consultant and asks for comments. b: uses results to develop occupational health and safety plans. c: reports implementation of recommended risk reduction measures to top management. d: reports the implementation of recommended risk reduction measures to health committee stipulated under ISH Law. e: considers the opinions of foremen and supervisors assigned to workshops to implement recommended risk reduction measures. f: miscellaneous.

Source: Basic Survey on Industrial Safety and Health, 2005 [11].



**Table 8.** Reasons for not implementing workplace risk assessments

Size or sector of workplace	Not implementing risk assessment (%)	Reason for not implementing risk assessment (%)					
		a	b	c	d	e	f
1,000-	[30.5] 100.0	31.0	13.0	8.1	11.8	25.4	51.5
500-999	[50.6] 100.0	55.0	32.1	2.6	5.3	15.5	43.8
300-499	[65.9] 100.0	54.5	38.8	14.5	27.7	5.9	26.6
100-299	[76.1] 100.0	70.1	54.9	1.4	14.6	10.1	13.1
50-99	[73.4] 100.0	60.5	42.5	3.4	25.5	14.8	15.8
30-49	[80.7] 100.0	46.8	36.6	3.0	33.3	14.2	19.4
10-29	[80.7] 100.0	45.9	35.9	2.2	31.1	13.8	24.3
Construction	[76.7] 100.0	58.9	46.4	3.2	14.4	10.7	22.2
Manufacturing	[77.8] 100.0	57.7	42.0	2.5	32.2	17.7	14.5
Electricity, gas, heat or water supply	[58.8] 100.0	28.5	34.8	0.9	14.4	10.4	54.6
Information and telecommunications	[90.7] 100.0	46.4	20.6	1.3	47.6	18.6	25.1
Transportation	[67.2] 100.0	59.9	34.9	2.0	23.4	19.8	19.3
Sales and retail	[81.2] 100.0	40.5	35.0	2.3	29.3	10.3	28.6
Restaurant and hotel	[89.5] 100.0	45.1	35.4	1.7	35.2	9.6	21.4
Other services	[81.4] 100.0	43.6	32.5	3.3	42.8	20.6	18.8
Total	[79.6] 100.0	48.5	37.5	2.5	30.0	13.7	22.3

a: lack of personnel familiar with risk assessments. b: lack of knowledge of how to implement risk assessments. c: questions regarding efficacy in reducing industrial accident rates. d: no history of accidents. e: sense that enough has been done to ensure legal compliance. f: miscellaneous.

Source: Basic Survey on Industrial Safety and Health, 2005 [11].

quiring workers to wear protective articles (Table 6).

## Risk Assessments at Workplaces in Japan

The performance of risk assessments in workplaces in Japan was surveyed by the MHLW in 2005, one year before enforcement. This is to be repeated every five years. In 2005, the performance rate among all enterprises responding to this survey was 20.4%, and it was only among workplaces having 1,000 or more employees that the majority of risk assessments were performed (Table 7) [11]. The survey did not address the background knowledge of the respondents, so the results may overestimate the application of risk assessments, as defined in governmental guidelines. Even at workplaces implementing risk assessments, fewer than 20% applied the results to plan occupational health and safety policy. Two common reasons for not implementing risk assessments were lack of personnel or knowledge in how to implement the assessments. There

appeared to be little question regarding the efficacy of such assessments in reducing rates of industrial accidents (Table 8). Based on the 11th Industrial Accident Prevention Plan implemented in Japan from 2008 to 2012, which seeks to promote risk assessments, these numbers are expected to improve in the next survey.

## Harmonizing Legislative Compliance with Voluntary Action

ISH Law in Japan specifies criminal penalties for both individuals and organizations (e.g., corporate bodies). Employers should be fully aware that criminal punishment of any company will lead to government sanctions, judiciary decisions leading to damage compensation, and mass media criticism. Moreover, under the Labor Contract Law promulgated in Japan in December 2007, employers are burdened with wide-ranging obligations to make reasonable efforts to ensure employee

health and safety for foreseeable and avoidable risks. This means that enterprises neglecting even the non-binding provisions of various guidelines are likely to suffer significant business impact if judged to be responsible for defective merchandise, pollution, driver-caused accidents, industrial accidents, or occupational disease. These social risks may damage customer confidence and result in competitive disadvantages, investor disapproval, and even boycotts among consumers. The idea of risk assessment is widely deemed to be an effective system for foreseeing and avoiding harmful consequences arising from the working environment, materials, work methods, work schedules, work behavior, and worker health status [22]. To promote and strengthen the roles of the relevant personnel at workplaces in Japan, particularly in small businesses, we must strengthen technical, financial, and physical support from public-service organizations in the sphere of occupational health and safety, encourage the dissemination of good practices to reduce risks, and consider additional employer incentives, including relaxed mandatory regulations [23,24].

## References

1. Horie S. Status and future tasks of OHS in Japan. *International Congress Series* 2006;1294:61-4.
2. Molyneux MK, Wilson HG. An organized approach to the control of hazards to health at work. *Ann Occup Hyg* 1990; 34:177-88.
3. Raworth P. Regional harmonization of occupational health rules: the European example. *Am J Law Med* 1995;21:7-44.
4. Russell RM, Maidment SC, Brooke I, Topping MD. An introduction to a UK scheme to help small firms control health risks from chemicals. *Ann Occup Hyg* 1998;42:367-76.
5. Money CD. European experiences in the development of approaches for the successful control of workplace health risks. *Ann Occup Hyg* 2003;47:533-40.
6. Combes R, Dandrea J, Balls M. A critical assessment of the European Commission's proposals for the risk assessment and registration of chemical substances in the European Union. *Altern Lab Anim* 2003;31:353-64.
7. Rogers MD. The European Commission's White Paper "strategy for a future chemicals policy": a review. *Risk Anal* 2003; 23:381-8.
8. JISHA OSHMS Accreditation Center, Japan Industrial Safety and Health Association. JISHA OSHMS Standards Certification. (on line), <http://www.jisha.or.jp/english/oshms/index.html>, (accessed July31, 2010)
9. Japan Construction Safety and Health Association. Construction Occupational Health and Safety Management Systems (COHSMS). (on line), <http://www.kensaibou.or.jp/english/cohsms/index.html>, (accessed July31, 2010)
10. Industrial Safety and Health Department, Labour Standards Bureau, Ministry of Health, Labour, and Welfare. Result of the voluntary inspections on industrial safety and health organization at large workplaces. (on line), <http://www.mhlw.go.jp/topics/2004/02/tp0217-1.html>, (accessed July31, 2010) (in Japanese)
11. Statistics and Information Department, Ministry of Health, Labour, and Welfare. Basic Survey on Industrial Safety and Health, 2005 (on line), <http://www.mhlw.go.jp/toukei/itiran/roudou/saigai/anzen/05/index.html>, (accessed July31, 2010) (in Japanese)
12. Kondo M. New developments in the occupational safety and health management system. *J UOEH* 2004;26:369-79.
13. Labour Standard Bureau, Ministry of Health, Labour, and Welfare. List of documents on risk assessments. (on line), <http://www.mhlw.go.jp/bunya/roudoukijun/anzenisei14/index.html>, (accessed July31, 2010) (in Japanese)
14. Japan Industrial Safety and Health Association. Support system for implementing risk assessment. (on line), [http://www.anzen.jaish.gr.jp/risk/risk\\_index.html](http://www.anzen.jaish.gr.jp/risk/risk_index.html) (accessed July31, 2010) (in Japanese)
15. Karasawa M. The domestic and international status and future development of OSHMS as well as the safety of machines, etc. *Occupational Health Review* 2005;18:51-69.
16. Miyagawa M. Globally harmonized system of classification and labelling of chemicals on management of chemical substances. *Occupational Health Review* 2005;8:153-87. (in Japanese)
17. Sakurai H. Risk management in the field of occupational health. *Occupational Health Journal* 2009;32:14-9. (in Japanese)
18. Zalk DM, Nelson DI. History and evolution of control banding: a review. *J Occup Environ Hyg* 2008;5:330-46.
19. Bracker AL, Morse TF, Simcox NJ. Training health and safety committees to use control banding: lessons learned and opportunities for the United States. *J Occup Environ Hyg* 2009; 6:307-14.
20. Jones RM, Nicas M. Margins of safety provided by COSHH Essentials and the ILO Chemical Control Toolkit. *Ann Occup Hyg* 2006;50:149-56.
21. Hashimoto H, Goto T, Nakachi N, Suzuki H, Takebayashi T, Kajiki S, Mori K. Evaluation of the control banding method-comparison with measurement-based comprehensive risk assessment. *J Occup Health* 2007;49:482-92.
22. Mori K, Takebayashi T. The introduction of an occupational health management system for solving issues in occupational health activities in Japan. *Ind Health* 2002;40:167-74.
23. Muto T, Takata T. Financial assistance in promoting occupational health services for small-scale enterprises in Japan. *Int J Occup Med Environ Health* 2001;14:143-50.
24. Higashi T. Study on a model for future occupational health: proposal for an occupational health service model in Japan. *Ind Health* 2006;44:541-55.