

PRESENT SITUATION AND FUTURE DIRECTION OF FALL ACCIDENT PREVENTION MEASURES BASED ON THE INDUSTRIAL SAFETY AND HEALTH LAW

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In Japan, fall accident prevention measures are established based on the Industrial Safety and Health Law, and the Industrial Safety and Health Regulation was amended in 2009 to strengthen the measures for fall prevention from scaffolding. Among occupational death accidents in the construction industry, the ratio of the number of fall accidents is the highest; especially fall accidents from roofs or ladders are more increasing than that from scaffolding. Ministry of Health, Labour and Welfare (MHLW) started 12th Industrial Accident Prevention Plan in April 2013. The MHLW will examine safety-related measures in the future for fall from scaffolding and other high places, and will amend safety-related regulations, if necessary, to strengthen the occupational accident prevention measures.

Occupational accidents

In Japan, the number of casualties who are absent from work for more than four days and the number of deaths caused by occupational accidents have tended to decrease over a long period of time. However, the number of casualties who are absent from work for more than four days and the number of deaths has continuously increased during the past three years. The number of deaths has repeatedly increased and decreased in recent years. The number of occupational accidents in the construction industry has tended to decrease over a long period of time due to decreases in the amount of construction investment and the number of workers. In 2012, the number of casualties who were absent from work for more than four days increased to 17,073, and the number of deaths increased to 367 (Figure 1 - 2). Among occupational accidents in the construction industry, the ratio of the number of fall accidents to the number of accidents resulting in casualties who are absent from work for more than four days is approximately 35%, while the ratio to the number of accidents causing deaths is as high as approximately 43%. Regarding places where accidents resulting in casualties who are absent from work for more than four days occur, devices for high-place work such as ladders are ranked first, followed by roofs and scaffoldings, in that order. Regarding places where accidents causing death occur, roofs are ranked first, followed by scaffoldings and buildings, in that order.

Industrial Safety and Health Law and scaffolding-related provisions

In Japan, occupational accident prevention measures are established based on the Industrial Safety and Health Law and related cabinet orders, ministerial regulations, public notices, announcements, and notifications. Therefore, fall accident prevention provisions in the Industrial Safety and Health Law and related regulations are described first.

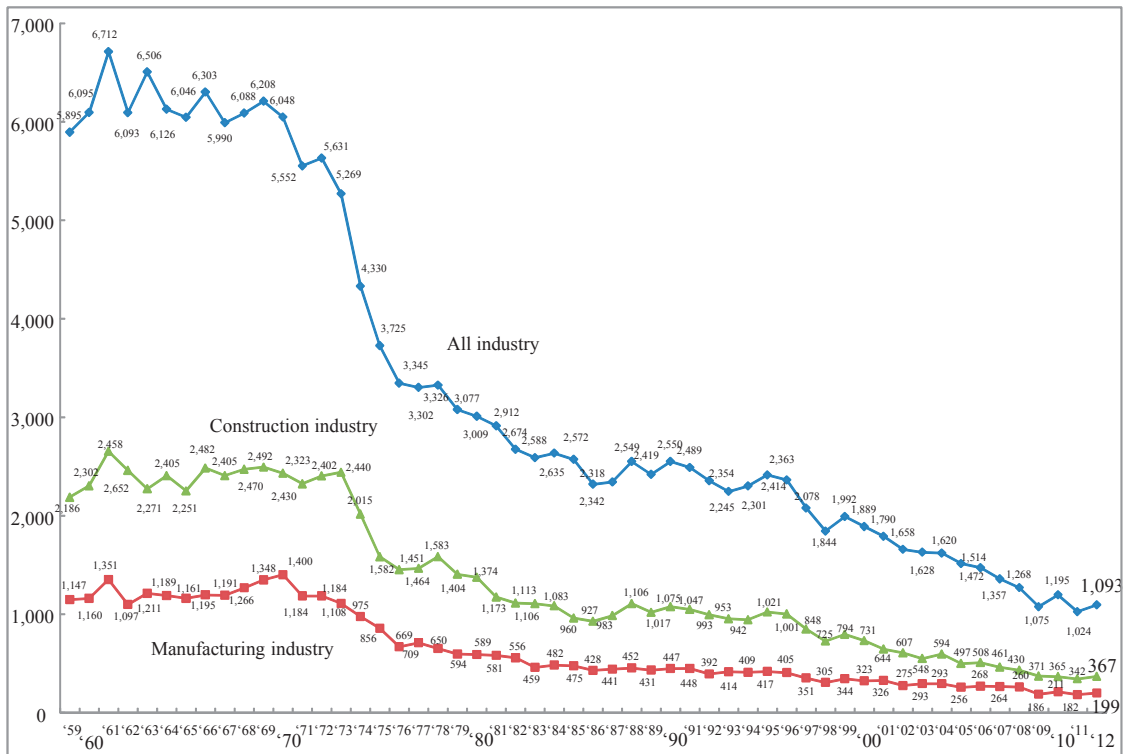


Figure 1. Changes of number of occupational death accidents from 1959 to 2012 (persons)

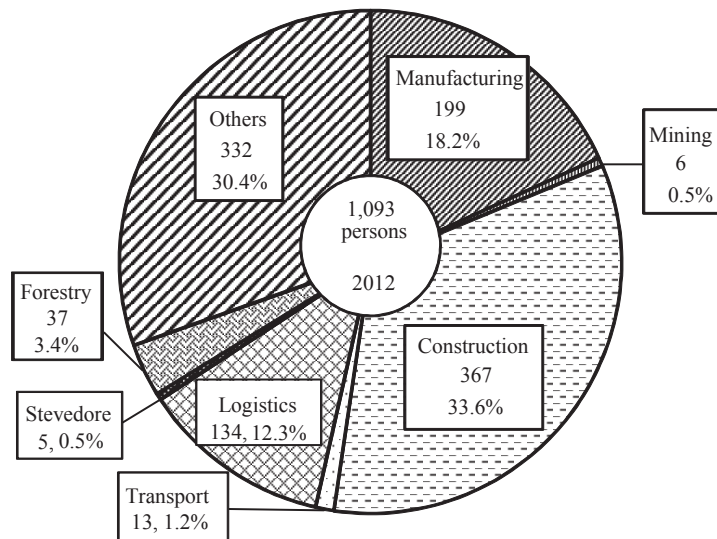


Figure 2. Classification of number of occupational death accidents in 2012 (persons)

The Industrial Safety and Health Regulation provides the standards that are intended to prevent fall accidents. The Regulation states that an employer shall provide a working floor by scaffolding or by other methods if an employer carries out an operation at a place having a height of 2 meters or more. If working floors are difficult to install, the employer shall take the measures of installing a protective net, having workers use safety belts, etc. to prevent workers from being injured due to falling. The Industrial Safety and Health Regulation also provides various measures that employers must take to prevent fall accidents and requirements for passages and scaffoldings. The public notice of the Minister of Health, Labour and Welfare also provides the strengths and shapes of components and furniture used for steel-pipe scaffolding.

When setting up scaffolding which is more than 5 m above the floor level, the employer must select a chief worker, and operations must be performed under the command of the chief worker.

When setting up scaffolding which is more than 10 m above the floor level, the employer must submit the operation plan to the Chief of the Labour Standards Inspection Office.

According to the Industrial Safety and Health Law, the principal employers (general contractors who contract with the ordering bodies) are obliged to execute comprehensive safety and health management in order to prevent occupational accidents that occur when workers of different employers cooperate in a same place to perform operations at one time. The Industrial Safety and Health Law stipulates provisions which focuses on the characteristic of the construction industry.

Fall accident prevention measures taken by the Ministry of Health, Labour and Welfare

In Japan, the construction works are generally pursued after receiving orders. Workers work at different worksites every new order and the contents of the operation change within a short period of time. Furthermore, workers from different employers often cooperate in a same place to perform operations at one time under a multilayered contract system, and a business structure is adopted in which branches and business offices of companies are in charge of multiple worksites. Based on the above facts, the Ministry of Health, Labour and Welfare (MHLW) established “comprehensive occupational accident prevention measures for the construction industry” in which the safety and health management measures performed by principal employers and related contractors were summarized according to the type of implementing body. The abovementioned measures were exhibited in the form of the notification by the Director-General of the Labour Standards Bureau. The MHLW has guided principal employers and related contractors to precisely execute occupational accident prevention measures based on the abovementioned measures. The MHLW has also guided and urged associations on occupational accident prevention, construction-related associations, and ordering bodies to perform occupational accident prevention activities according to their roles.

In the case where encouragement of companies’ voluntary approaches is effective for preventing occupational accidents, the MHLW has entrusted activities such as training to associations on occupational accident prevention. At present, the activities performed as fall accident prevention measures are as follows:

- 1) Projects for promoting fall accident prevention measures (construction)
 - A preceding handrail construction method for scaffolding is instructed at worksites for its diffusion.
- 2) Projects for diffusing fall prevention measures in high-place work where scaffolding is difficult to install
 - A standard operation manual is created for works on roofs where scaffolding is difficult to install.
 - A workshop that demonstrates fall accident prevention measures is held for works on roofs where scaffolding is difficult to install.

Recent revision of regulations

In order to prevent occupational accidents due to falls from scaffolding, the Industrial Safety and Health Regulation was amended in March 2009, and the revised provisions were enforced in June 2009. The amended points are as follows (Figure 3):

Regarding prefabricated scaffoldings, installation of a crossing diagonal brace was sufficient before the amendment. After the amendment, lower rails must be installed at a position 15–40 cm above the floor level, or more than 15cm toe boards or preceding handrails must be installed.

Regarding scaffolding other than prefabricated scaffoldings, such as tube and coupler scaffolding, the height of a handrail was increased from 75 cm to 85 cm. Furthermore, middle rails must also be installed at a position 35–50 cm above the floor level.

In April 2009, “further safety measures,” which are desirable to be adopted together with enforcement of the amended Industrial Safety and Health Regulation, were exhibited in the form of the notification by the Director-General of the Occupational Safety and Health Department. There have been a variety of efforts to implement these further safety measures. The key points of these further safety measures are as follows:

- Regarding prefabricated scaffolding, additional upper rails and scaffolding specific to preceding handrails should be installed.
- Regarding scaffolding other than prefabricated scaffolding, toe boards should be added.
- A preceding handrail construction method should be used and easy-to-work and comfortable scaffolding should be installed.
- Safety check of scaffolding etc. should consistently be performed.

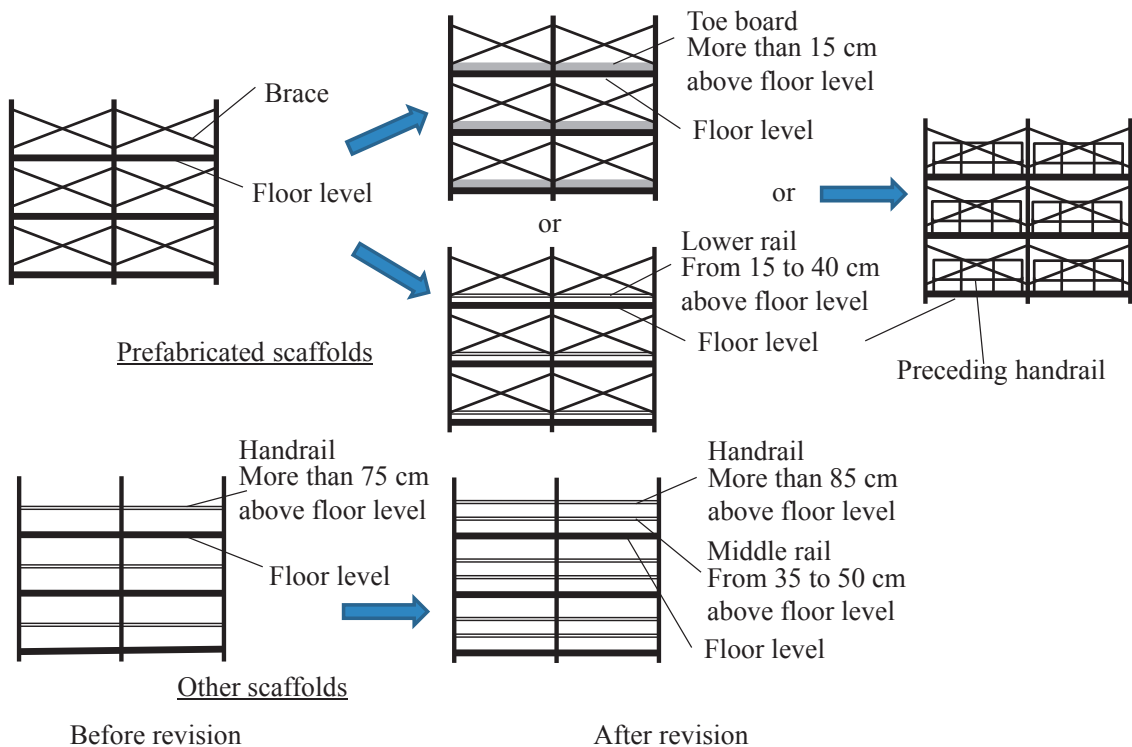


Figure 3. Revision of the Industrial Safety and Health Regulation in 2009

Evaluation of regulation amendment and further measures

After the amendment of the Industrial Safety and Health Regulation in 2009, the MHLW has analyzed data on accidents caused by falls from scaffolding every year. The MHLW has also held “meetings to verify and evaluate the effectiveness of measures to prevent falls from scaffolding” consisting of professors and researcher. The MHLW summarized the suggestions and opinions expressed in the meeting and issued a report every year.

According to the results obtained by analyzing data of the fiscal year 2011 (latest data), approximately 90% of accidents caused by falls from scaffolding occurred at worksites where measures based on the Industrial Safety and Health Regulation were not appropriately taken. Approximately 9% of the accidents occurred at worksites where measures based on the Industrial Safety and Health Regulation were taken, but workers behaved unsafely, such as climbing on the outside of scaffolding. Slightly more than 1% of the accidents occurred at worksites where measures based on the Industrial Safety and Health Regulation were taken and no unsafe behaviour was observed.

Therefore, in the meeting report, the following measures were pointed out:

- Observance of the Industrial Safety and Health Regulation
- Enforcement of measures to avoid unsafe behaviour
- Further diffusion of a preceding handrail construction method
- Development and diffusion of easy-to-fabricate scaffolding devices and easy-to-use scaffolding parts

Based on suggestions in the meeting report, “guidelines for promotion of comprehensive measures to prevent scaffolding accidents” were established in February 2012 in order to prevent scaffolding accidents by diffusing “further safety measures” and a preceding handrail construction method. The guidelines were exhibited in the form of the notification by the Director-General of the Occupational Safety and Health Department. The MHLW has facilitated scaffolding accident prevention measures based on this guideline.

12th Industrial Accident Prevention Plan

Since 1958, the MHLW has formulated a revised version of the Industrial Accident Prevention Plan 11 times and positively implemented various policies based on these plans. Based on the recent situation of occupational accidents and social changes, the 12th Industrial Accident Prevention Plan, a five-year plan that starts in fiscal 2013 and is to complete in fiscal 2017, has started in April 2013. The 12th plan contains the following six important activities:

- 1) Concentration of occupational accident prevention measures according to the changing situation of occupational accidents and diseases.
- 2) Prevention of occupational accidents by administrative bodies in cooperation with associations on occupational accident prevention and industry associations.
- 3) Encouragement of societies, companies, and workers to change their way of thinking about safety and health.
- 4) Implementation of policies based on scientific evidence and international trends.
- 5) Intensification of endeavour by ordering bodies, manufacturers, and managers of facilities
- 6) Further measures that will correspond with the issues on the Great East Japan Earthquake and Tokyo Electric Power Company’s Fukushima No.1 Nuclear Power Plant Disaster.

The construction industry aims to decrease the number of fatal accidents by more than 20% in 2017 compared with 2012. The following four measures will be implemented for the construction industry:

- (1) Promotion of fall accident prevention measures
 - (a) Promotion of measures to prevent accidents due to falls from various places
In addition to promotion of scaffolding accident prevention measures, devices and methods to prevent accidents caused by falls from ladders, roofs etc. should be developed and diffused (Figure 4).
 - (b) Diffusion of harness-type safety belts
Safety belts, which ease impact at the time of a fall, should be diffused in such a way that harness-type safety belts are mandatory under certain conditions (e.g. work at the place of difficulty in rescuing a worker when the worker falls).
- (2) Promotion of policies on the basis of nationwide manpower shortage following the Great East Japan Earthquake
Administrative bodies request ordering bodies of construction works to integrate expenses required for securing safety and health. Administrative bodies also guide principal employers to execute comprehensive safety and health management at construction sites.
- (3) Promotion of safety measures in demolition works
Administrative bodies establish the Guidelines for safety measures in demolition and repair works of buildings, etc. .
- (4) Promotion of safety measures in restoration and reconstruction works due to natural disasters
Occupational accident prevention measures should be thoroughly adopted in restoration and reconstruction works due to natural disasters caused by typhoons, heavy rains, heavy snows, and tornados, which have occurred frequently in recent years.

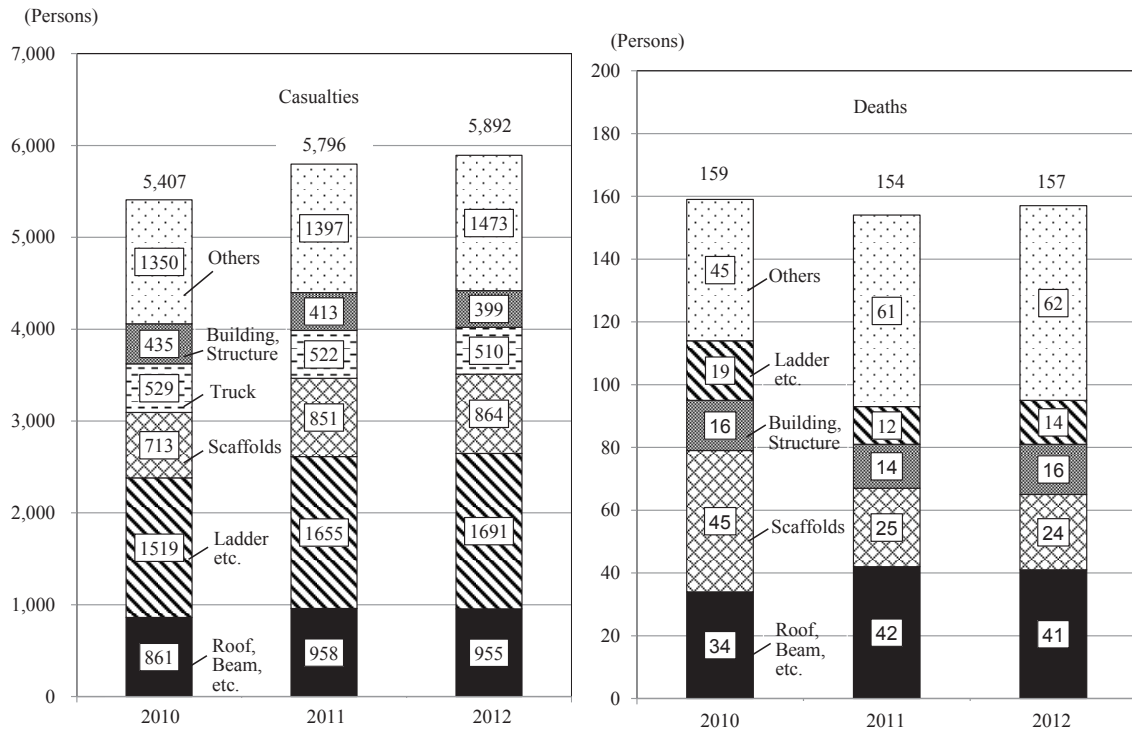


Figure 4. Classification of fall place when accidents happened from 2010 to 2012

Future direction

Regarding scaffolding accident prevention measures, the MHLW held a “meeting to verify and evaluate the effectiveness of measures to prevent falls from scaffoldings” in September, which consisted of professors, researcher and representatives from scaffolding and construction equipment manufacturers and construction-related associations. In the future, the meeting will be continuously held to examine the effectiveness of prevention measures established based on the Industrial Safety and Health Regulation, which were amended in 2009, and to discuss what type of measures will be required.

In the case where scaffolding is difficult to install, such as cleaning of building window glasses and inspection and repair of bridges, rope-access works must be performed. Therefore, a “meeting to examine safety measures in rope-access works” will be held to examine safety measures for rope-access works.

Recently, the MHLW has requested the National Institute of Occupational Safety and Health, Japan (JNIOSH) to develop devices and methods to prevent accidents caused by falls from ladders and roofs. After these devices and methods have been developed, the MHLW will attempt to diffuse them.

Regarding methods and devices to prevent falls from roofs and buildings in repair works, since fall accidents have frequently occurred in repair works for house roofs which were damaged in the Great East Japan Earthquake in 2011, the JNIOSH formed an “examination committee to prevent falls from roofs and buildings” and made a report in cooperation with the Japan Safety Appliances Association. The MHLW has been publicizing and instructing construction-related companies on the contents of this report.

The MHLW will guide companies to execute occupational accident prevention measures and will entrust the related projects to institutes and companies, while concentrating measures contained in the 12th Industrial Accident Prevention Plan. The MHLW will hold meetings to examine the safety-related measures in the future, while also listening to opinions of professors, researchers and persons from the construction and manufacturing industries. The MHLW will amend safety-related regulations, if necessary, to strengthen the occupational accident prevention measures.