

Occupational Slipping Accidents in Thailand: Main Causes and Prevention

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Abstract

The objectives of this work were to study work-related slipping accidents occurred under the Workmen's Compensation Fund (WCF) and to introduce guide-lines to prevent the accidents. In 1997, the number of accidents in the category of "fell over or slipped" was 5 565 cases. From this number, 3 158 cases or 57% were initiated by slipping. In considering only slipping accidents, 1 982 cases or 63% were males. The age group that mostly contributed to these accidents was between 18-25 years with the frequency of 856 cases or 27%, and the number of cases decreased with the older age groups. The type of business that most contributed to the slipping accidents of 662 cases or 21% was food, drink, and tobacco industries. The most popular cause of the accidents of 1 748 cases or 55% was working environment. The part of the body that most affected by the accidents was the knee which contributed for 334 cases or 11%. The compensation paid for the slipping accidents was about US\$ 0.318 million or 0.7% of the total compensation paid by the WCF. The category of more than 3 day lost time was the leading group contributed about US\$ 0.209 million or 65.7%. To seek for ways to reduce or prevent this type of accidents, the working environment of 6 frozen sea food factories were studied. After discussing with related persons in the factories, the guide-lines to prevent or reduce the slipping accidents were

introduced. Recommendations are (1) wipe the floor as often as necessary to keep the walking surface clean and free from accumulated dirt, (2) improve all containers used in the movements of materials in the process so that the spillover could be prevented, and (3) educate the employees to realize the importance of the accidents and suggest ways to prevent them.

1. Introduction

Slip, trip, and fall (STF)-related accidents are costing our societies both lives and property. According to Courtney et al. [1], the cost of STF related occupational accidents ranged from 20-40% of all disabling occupational injuries in developed countries. In the USA, the annual direct cost for STF accidents was approximately US\$ 6 billion. From this figure, the accidents initiated by slipping were about 40-50% of fall-related injuries. In the same study, they reported that there were 4 507 work related fatal falls (excluding New York City) during the years 1992 and 1998. For the non-fatal, fall-related injuries, The United States Bureau of Labor Statistics (BLS) reported 330 913 cases involving 1 or more day away from work in 1996. From this amount, 30% were falls to a lower level with 66% to fall on the same level, and 4% to jumps to a lower level. In mainland Britain, Health and Safety Executive (HSE) [2] reported that there were 34 554 cases of STF-related injuries on the same level during 1997-1998. From these cases, 8 671 or 25% were

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major injuries and 25 883 or 75% were more than 3 day lost time. Proctor and Coldman [3] concluded from their work that the STF-related accidents in England contributed almost 18% of all accidents involving absence from work for more than 3 days.

In Sweden, the information system on arbetsskador (ISA) reported that, in 1998, there were 37 914 work-related accidents caused at least 1 day away from work. From the data reported, the most frequent case was STF-related accidents contributed 7 810 cases or 22%. Considering only STF-related accidents, 2 690 cases or 33% were falling to lower level and 5 201 cases falling on the same level [1].

The information mentioned above indicated that slipping was the important cause of accidents, causing a big loss of productivity to our society. The objectives of this work were to present detailed information of slipping accidents that occurred in Thailand under the WCF, then, after a comprehensive study on the working environment of the most risky firms, recommendations were produced on how to prevent or reduce this kind of accident.

2. Methods

The information of occupational accidents in the category of “fell down or slipped” obtained from the WCF for the year of 1997 was studied and analyzed to understand the characteristics of the accidents occurred. After analyzing, the kind of firms that have a high risk are identified. Then the visits to the related firms were scheduled. The aim of the visits was to seek for the root causes of the slipping and to consult with the related people e.g. safety officers, engineering managers, and production managers of the firms to seek for ways to prevent the accidents. After visiting 6 frozen Sea Food Factories situated in the provinces of Samutprakarn and Samutsarkorn, the main causes of the accidents were roughly identified. Once the root causes were uncovered, recommendations to prevent or reduce the slipping accidents in the firms were made.

3. Results

As a result of the analyzing of the data received from the WCF for the year of 1997, the detailed characteristics of the slipping accidents were presented in Table 1. In 1997, the number of workers under the WCF was 6.08 million or 18.5% of the total work-force of the country. In the year studied, the number of accidents occurred under the WCF was 230 376 cases. The accidents under the category of “fell over or slipped” were 5 565 cases or 2.4% of the total accidents. In considering only the category of “fell over or slipped”, only 3 158 cases or 57% were recorded that they were initialized by slipping [4]. After analyzing only the cases initiated by slipping, the more detailed characteristics of the accidents were found. The male workers contributed 63% of the total number of the accidents although most of the workers in the firms studied were female. The age groups that most contributed to the accidents ranged from 18-25 yrs (27%), 26-30 yrs (20%), and 31-35 yrs (15%), respectively. The older the age group, the less contribution to the accidents.

Types of firms that most contributed to the accidents were “Food, Drink, and Tobacco” which contributed of 21%, “Miscellaneous” of 16%, and “Construction, Facility Installation, and Digging Wells” of 13%. This was the reason that the firms producing frozen sea food were chosen to be visited for this study. Furthermore, the causes of the slips were also well documented in the accident investigations. From the information studied, the cause recorded as “Environment in Workplace” was the most frequent records of 55%. The next ones were “Working Posture” of 22% and “Building or Constructing” of 9%. The parts of the body most affected by the accidents were equal between “Knee” and “Head” of 11% and “Multiple body parts effected” of 10%. For the degree of seriousness, the most frequent category was “Lost Time Less Than 3 Days” of 65.8%, the next one “Lost Time

Table 1 The detailed characteristics of “Fell Over or Slipping” accidents initiated by slipping in Thailand in 1997

Detailed Characteristics	Quantity
Total work force of the country (million persons).....	32.78
Workers under the WCF (million persons).....	6.08
Workers under the WCF (% of total work force).....	18.50
Total number of accidents occurred (cases).....	230 376
Number of “Fell over or Slipped” (cases).....	5 565
Number of “Fell over or Slipped” (% of total number of accidents).....	2.4
Number of “Fell over or Slipped” accidents initiated by slipping (cases).....	3 158
Slipping accidents (% of “Fell over or Slipped” accidents).....	57
The detailed of the 3 158 “fell over or slipped” accidents initiated by slipping:	
Gender:	
Males (1 982 cases) (%).....	63
Females (1 167 cases) (%).....	37
Age groups:	
18-25 years (856 cases) (%).....	27
26-30 years (633 cases) (%).....	20
31-35 years (473 cases) (%).....	15
Types of firms:	
Food, drink, and tobacco (662 cases) (%).....	21
Miscellaneous (503 cases) (%).....	16
Construction, facilities installation, and digging wells (420 cases) (%).....	13
Causes of the slipping:	
Working environments (1 748 cases) (%).....	55
Working postures (686 cases) (%).....	22
Building or construction (270 cases) (%).....	9
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Parts of the body affected by the accidents:	
Knee (334 cases) (%).....	11
Head (333 cases) (%).....	11
Multiple parts (317 cases) (%).....	10
Degree of seriousness:	
Lost time not more than 3 days (2 079 cases) (%).....	65.8
Lost time more than 3 days (1 072 cases) (%).....	33.9
Fatality (4 cases) (%).....	0.1
Cost of the accidents initiated by slipping (Total of US\$ 0.318 million):	
Lost time more than 3 days (US\$ 0.209 million) (%).....	65.7
Lost time not more than 3 days (US\$ 0.068 million) (%).....	21.4
Fatality (US\$ 0.040 million) (%).....	12.6

More Than 3 Days” of 33.9%, and the last one “Fatality” of 0.1%. The total expenditure for the slipping accidents paid by the WCF was US\$ 0.318 million. From this amount of fund, the category that most contributed was “Lost Time More Than 3 Days” of 65.7%, “Lost Time Less Than 3 Days” of 21.4%, and “Fatality” of 12.6%.

4. Frozen Food Factories Audited

According to the information obtained from the factory visits done during the period of June and July, 2001, the floors of the workplaces were always wet for this kind of factories. The workers in the production lines were mostly females. During working, all workers were wearing PVC boots, as shown in Figure 1. Most of the floors of the factories were made of smooth cement and ceramic tiles. Also the floor of the frozen room was made of the smooth cement. During the audits, waste from sea food was observed e.g. meat and skin of fish and cuttlefish, shell and meat of shrimps. Sometimes, detergent powder used to clean the floor was seen. Ice was used to keep sea animals fresh during transportation from the port to the factory. The ice was also observed sometimes on the floors of the factories. Figures 1 and 2 also present the floors with some scrap on them. These waste materials are



Figure 1 The plastic boots used in food factories and the slippery and wet floor with scrap of materials.



Figure 2 The scrap from parts of sea animals on the floor promotes slipperiness.

very dangerous and slippery if the workers walked and stepped on them. Apart from those mentioned above, the floors of the frozen rooms were very slippery due to the thin icy surface forming on the floor due to the cold conditions.

5. Causes of Slipping in Frozen Sea Food Factories

According to the several discussions made during the factory visits with some related persons and the records on slipping accidents for each factory, the causes of such accidents were summarized as follow: (1) stepping on ice, (2) stepping on detergent powder used to clean the floor, (3) freezing surface floor in the frozen room, (4) stepping on fish meat or skin, (5) stepping on the floor contaminated with fish fat, and (6) smooth cement surface. Considering the records obtained from some factories visited indicated that the causes 1-3 made up of almost 80% of the whole records.

6. Prevention of Slipping Accidents

Also from the discussions mentioned above, the preliminary methods to prevent slipping accidents are concluded below:

1. Keep the walking surfaces always clean. Whenever, some scrap is seen on the floor, collect it as soon as possible and followed by the proper cleaning procedure. When the floor is being cleaned, put notice on to remind all workers about the slipperiness of the floor.

2. Materials handling equipment used to convey related materials in the production process should be improved to prevent spilling over of the materials carried.

3. Educate all workers to understand the important of slipping accidents. Also, they should know how to prevent slipping.

Apart from the preliminary methods mentioned above, the more study should be done on determining the appropriate boot materials to be used with the existing floors in the real conditions. To do this, a facility that can be used to measure friction available between shoe heel materials and floor surfaces is required.

7. Conclusions

As the information presented above, slipping accidents in Thailand are considerable. The data analyzed in this work is from the population of about only 18.5% of the total work-force of the country. According to the recording procedures of the Workmen's Compensation Fund, comparing this data with some other countries is difficult.

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