

**Annex A**



# **Workplace Safety and Health Report 2009**

*Workplace Safety and Health Council*

*March 2010*

## Highlights

- In 2009, there were fewer occupational diseases and workplace injuries reported across the board. Occupational diseases fell by over 45%. The total number of work injuries dropped 2.1% from 11,072 in 2008 to 10,834 in 2009. Amongst the three types of work injuries that make up this total, two of them - temporary and permanent disablements – also saw a drop. This came alongside overall decrease in volume of work activities in 2009.
- There is, however, an increase in the number of fatalities and a slight edging up of the workplace fatality rate from 2.8 deaths per 100,000 employed persons in 2008 to 2.9 last year. This increase in the workplace fatality rate is also the first since 2005, and reflects the need to do more to prevent serious incidents in our workplaces.
- This trend is also reflected in the accident frequency and severity rate. The accident frequency rate saw a drop from 1.9 per million man-hours worked in 2008 to 1.8 in 2009. While the accident severity rate at 112 man-days lost per million man-hours worked was the same in 2009 as 2008, there were more man-days lost due to more serious incidents – about 20,000 more man-days lost in 2009 or a 3.3% increase (see Annex 1, Table 1-2).

## Workplace Fatalities

- More workers were killed in workplace incidents in 2009. There were 70 fatalities (67 incidents) in 2009, up from 67 fatalities (60 incidents) in 2008.
- Construction continued to register the highest number of workplace fatalities. There were 31 fatalities in 2009, an increase from 25 in 2008. In terms of fatality rate, the sector posted a rate of 8.1 per 100,000 employed persons in 2009, up from 6.9 per 100,000 employed persons in 2008.
- Marine reported 13 fatalities in 2009, similar to that of 2008. The industry's fatality rate rose to 11.1 per 100,000 employed persons in 2009 from 9.2 per 100,000 employed persons in 2008.

- Hotels and Restaurants, as well as Landscape Care and Maintenance Service Activities sectors saw an increase in the number of fatalities in 2009. Hotels and Restaurants registered 2 deaths in 2009, up from zero death in 2008, while the Landscape Care and Maintenance Service Activities sector had 1 death in 2009, up from zero death a year ago.
- For Manufacturing, there was a drop in both fatality numbers and the fatality rate. The rate fell from 2.9 in 2008 to 2.6 in 2009.

### **Permanent Disablements**

- In 2009, fewer employees sustained permanent injuries in work incidents – 126 as compared to 132 in 2008. The rate also dropped from 5.6 workers permanently injured for every 100,000 employed persons in 2008 to 5.2 in 2009. Construction and Manufacturing are the largest contributors to permanent disablements, accounting for about 70% of these cases.

### **Temporary Disablements**

- Temporary disablements went down by 2.2% in 2009.
- The Construction, Marine and Manufacturing sectors made up a combined 54% of total temporary work injuries.
  - Manufacturing and Marine saw an 8.1% and 13% decrease respectively over the previous year. This coincided with the decrease in work activities in the two sectors.
  - Among the 3 sectors, Marine was the only one with an increased temporary disablement rate.

### **Occupational Diseases**

- There were 468 cases of occupational diseases (OD) confirmed, some 45% less than the year before. The overall OD incidence rate stood at 19.3 cases per 100,000 employed persons, down from 36.2 cases per 100,000 employed persons. This was also the lowest number of ODs confirmed since 2004, with the decrease consisting mainly of

Noise Induced Deafness (NID) cases. The NID Prevention Programme<sup>1</sup> has raised awareness about the disease and hence led to increased reporting of such cases in 2008. As many cases were already detected and reported from the current workplaces under medical surveillance for noise, this may have contributed to the decline in the reporting of new cases in 2009.

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<sup>1</sup> Please refer to the WSH Council website at [www.wshc.gov.sg](http://www.wshc.gov.sg) for more information on this programme.

# 1. Overview

1.1 In 2009, there were fewer occupational diseases and workplace injuries reported across the board. Occupational diseases fell by over 45%. The number of workplace injuries<sup>2</sup> at 10,834 (including fatalities) in 2009 was a 2.1% decrease from 2008. Temporary disablements, which formed the bulk of the reported injuries, declined from 10,873 in 2008 to 10,638 in 2009. Permanent disablements, which comprised mainly amputations of the upper limbs, reduced from 132 injuries in 2008 to 126 in 2009 (Table 1). This was alongside a reduction in the volume of work activities in some sectors due to the economic downturn. Overall, the injury rates in 2009 also fell as compared to 2008 (Table 2).

1.2 There was, however, an increase in the number of fatal incidents which rose to 67 cases in 2009 from 60 cases in 2008. This led to a rise in the number of workplace fatalities to 70 in 2009, up from 67 in the previous year (Table 1). The workplace fatality rate also edged upwards to 2.9 deaths per 100,000 employed persons in 2009, from 2.8 in 2008 (Chart 1). The increase in workplace fatality rate is the first since 2005, and reflects that there is still more to be done to prevent serious incidents in our workplaces.

**Table 1: Number of Workplace Injuries and Occupational Diseases, 2008 and 2009**

	2009	2008
<b>Overall Workplace Injuries</b>	<b>10,834</b>	<b>11,072</b>
Fatal	70	67
Permanent Disablement	126	132
Temporary Disablement	10,638	10,873
<b>Occupational Diseases</b>	<b>468</b>	<b>855</b>

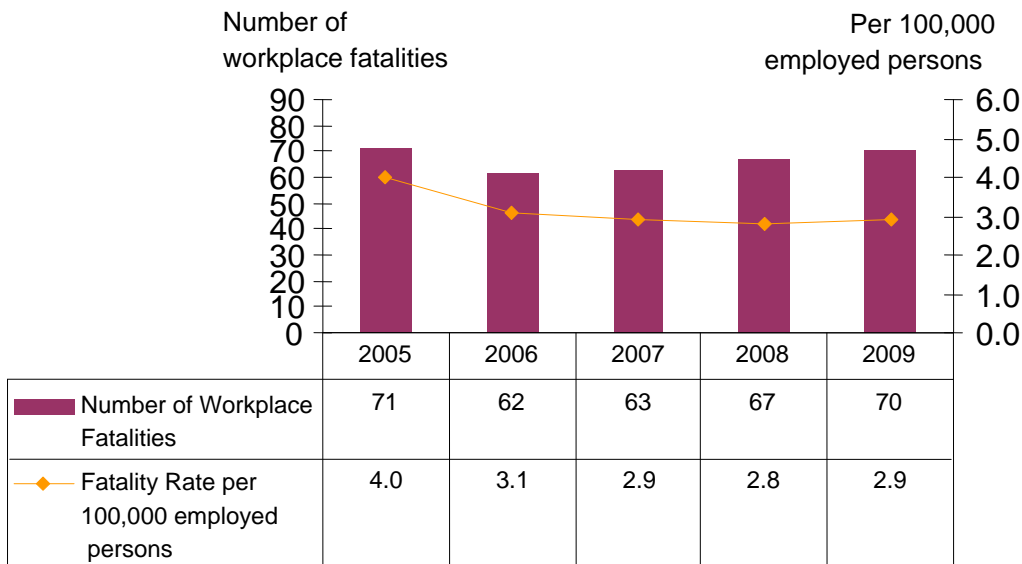
<sup>2</sup> A **workplace injury** is any personal injury, disease (acute) or death resulting from a workplace accident. Please refer to the annex for the types of workplace injuries covered.

**Table 2: Key Workplace Safety and Health Indicators, 2008 and 2009**

Per 100,000 employed persons

	2009	2008
<b>Overall Workplace Injury Rate<sup>3</sup></b>	<b>446</b>	<b>469</b>
Fatal	2.9	2.8
Permanent Disablement	5.2	5.6
Temporary Disablement	438	460
<b>Accident Frequency Rate<sup>4</sup></b>	<b>1.8</b>	<b>1.9</b>
<b>Accident Severity Rate<sup>5</sup></b>	<b>112</b>	<b>112</b>
<b>Occupational Disease Incidence<sup>6</sup></b>	<b>19.3</b>	<b>36.2</b>

**CHART 1: WORKPLACE FATALITY RATE, 2005 – 2009**



<sup>3</sup> Workplace Injury Rate =  $\frac{\text{No. of Fatal and Non-Fatal Workplace Injuries}}{\text{No. of Employed Persons}} \times 100,000$

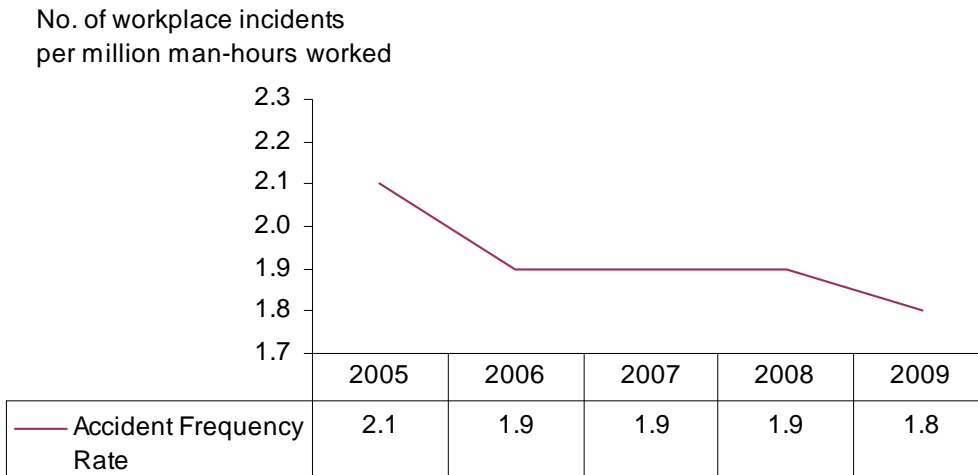
<sup>4</sup> Accident Frequency Rate (AFR) =  $\frac{\text{No. of Workplace Accidents Reported}}{\text{No. of Man-hours Worked}} \times 1,000,000$

<sup>5</sup> Accident Severity Rate (ASR) =  $\frac{\text{No. of Man Days Lost To Workplace Accidents}}{\text{No. of Man-hours Worked}} \times 1,000,000$

<sup>6</sup> Occupational Disease Incidence =  $\frac{\text{No. of Occupational Diseases (i.e. chronic confirmed cases)}}{\text{No. of Employed Persons}} \times 100,000$

1.3 The accident frequency rate (AFR), which measures how often workplace incidents occurred, was 1.8 incidents per million man-hours worked in 2009, a slight drop from 2008 ([Chart 2](#)). The accident severity rate (ASR) remained constant with that of 2008 ([Chart 3](#)). For every million man-hours worked, 112 man-days were lost to workplace incidents in 2009, same as a year ago. Though the rate remained constant, more man-days were lost due to incidents at work – 664,000 man-days were lost in 2009, up from 643,000 man-days lost in the previous year. Detailed industry breakdown of the ASR, AFR and man-days loss data can be found in [Tables 1-1 and 1-2 in Annex 1](#).

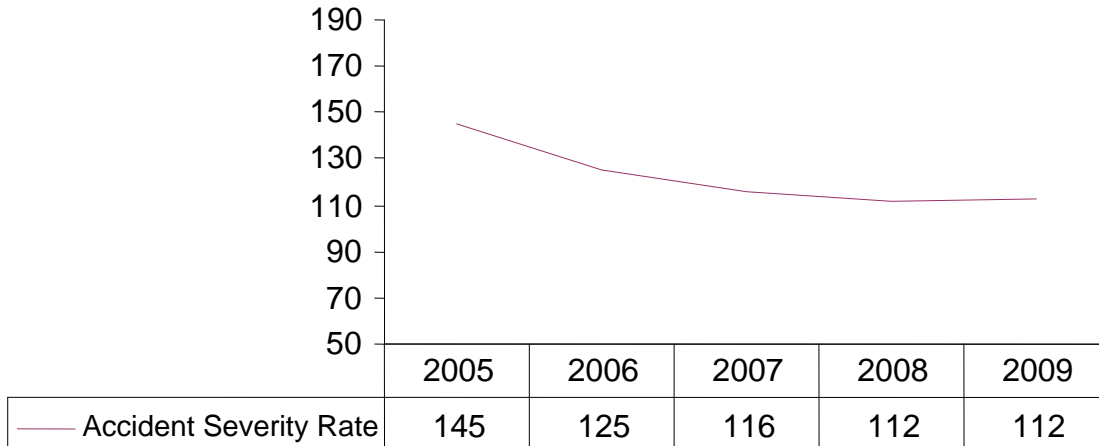
**CHART 2: WORKPLACE ACCIDENT FREQUENCY RATE<sup>7</sup>, 2005 – 2009**



<sup>7</sup> Prior to 2006, incident data only covered premises registered under the Factories Act. For the purpose of comparison with subsequent years' data (i.e. 2006 – 2009), incident number for 2005 was estimated using a different data source (based on workmen's compensation).

### CHART 3: WORKPLACE ACCIDENT SEVERITY RATE, 2005 – 2009

No. of man-days lost to workplace incidents per million man-hours worked



1.4 For occupational diseases (OD)<sup>8</sup>, 468 new cases were confirmed in 2009, about 45% less than the previous year (Table 1). This was also the lowest number of ODs confirmed since 2004, with the decrease consisting mainly of Noise Induced Deafness (NID) cases. Due to the significant drop in OD cases, there was a corresponding decline in OD incidence from 36.2 cases per 100,000 employed persons in 2008, to 19.3 in 2009 (Table 2).

<sup>8</sup> An **occupational disease** is a disease (chronic) contracted as a result of an exposure over a period of time to risk factors arising from work activity. A confirmed case of occupational disease is one where there is definite evidence that the worker suffers from a disease which is related to his occupation.



## 2. Fatal Workplace Injuries

### BY INDUSTRY

2.1 In 2009, there were 70 fatalities from 67 fatal incidents, up from 67 fatalities in 60 fatal incidents in 2008. There was one fatal incident which involved 4 victims in 2009, down from the five multiple-victim incidents which claimed a total of 12 lives in 2008. The multiple-victim incident that occurred in 2009 was from the *Architectural and Engineering Activities* sector, claiming 4 lives due to severe chemical burns.

2.2 *Construction* continued to report the highest number of workplace fatalities, accounting for 31 out of the 70 fatalities (Table 3). It accounts for 44% of the fatalities in 2009, up from 37% in 2008. In terms of numbers, it saw 6 more fatalities as compared to the previous year. It is important to note that, despite the economic downturn, the Construction industry continues to see an increase in building activities and an influx of new entrants to support the activity<sup>9</sup>. This means a larger workforce for the industry and an increase in the number of man-hours. In terms of fatality rate, the sector also posted a higher rate of 8.1 per 100,000 employed persons in 2009, up from 6.9 per 100,000 employed persons in 2008 (Table 4).

2.3 The *Marine*<sup>10</sup> sector account for about 19% of the fatalities. It reported 13 fatalities, similar to that of the previous year. This sector, however, experienced a decline in work activity in 2009. *Marine* also had the highest fatality rate amongst the 3 traditionally high risk sectors<sup>11</sup> (Table 4, also see highlighted rows in Table 3). Its fatality rate rose from 9.2 in 2008 to 11.1 in 2009.<sup>12</sup>

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<sup>9</sup> According to the Ministry of Manpower's Labour Market Report, 2009, employment in construction rose by 25,100 in 2009, driven by robust building activities.

<sup>10</sup> The marine sector includes the following activities:

- Shipbuilding and Ship Repair
- Marine Surveying Services (other than classification societies)
- Salvaging of distressed vessels and cargo

Works carried out in the anchorage are also included.

<sup>11</sup> The traditionally high risk sectors are Construction, Manufacturing and Marine.

<sup>12</sup> Due to a decrease in the number of persons employed, the Marine sector saw a higher fatality rate despite having the same number of fatalities as 2008.

2.4 For the *Manufacturing* cluster, there was a drop in both fatality numbers and the fatality rate. There were 11 fatalities in 2009, down from 13 in 2008. The rate fell from 2.9 in 2008 to 2.6 in 2009 (Table 4). For the *Petrochemical* sub-sector, (Table 3) there was a decrease from 3 deaths in 2008 to 1 death in 2009. The *Metalworking* sub-sector, however, saw an increase from 3 fatalities in 2008 to 6 in 2009. It continues to be the biggest contributor to fatalities within *Manufacturing*.

2.5 For the *Water Supply, Sewerage and Waste Management* sector, there was a significant decrease to 1 fatality in 2009 compared to 5 fatalities from a year ago. This relatively small sector saw its fatality rate reduced from 52.1 deaths per 100,000 employed persons in 2008 to 10.1 in 2009. *Logistics and Transportation*<sup>13</sup> had 3 workplace deaths in 2009, lower than the 6 deaths in 2008. Its fatality rate decreased from 6.5 in 2008 to 3.4 in 2009.

2.6 Both *Hotels and Restaurants*, as well as *Landscape Care and Maintenance Service Activities* sectors, saw an increase in the number of fatalities in 2009. *Hotels and Restaurants* registered 2 deaths in 2009, up from zero death in 2008, while the *Landscape Care and Maintenance Service Activities* sector had 1 death in 2009, up from zero death a year ago. This sector, which has a relatively small workforce, saw its fatality rate jumped from 0 in 2008 to 11.5 per 100,000 employed persons in 2009.

2.7 *Other Sectors* accounted for the remaining fatalities in 2009. These were primarily from workplaces with relatively lower safety risks. Of the 8 reported fatalities, 3 occurred in the *Administrative and Support Service* sector, 1 in the *Wholesale and Retail Trade* sector, while the remaining 4 were from a multiple-victim incident in the *Architectural and Engineering Activities* sector.

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<sup>13</sup> Logistics and Transportation covers the following activities:

- Storage and Warehousing
- Supporting Services to Land Transport (excludes car management services, services allied to transport of passengers and towing services)
- Supporting Services to Water Transport (excludes marine surveying services and salvaging of distressed vessels and cargo)
- Supporting Services to Air Transport
- Services Allied to Transport of Goods
- Services Allied to Transport of Goods NEC

**Table 3: Number of Workplace Fatalities by Industry, 2008 and 2009**

Industry	2009	2008
<b>All Sectors</b>	<b>70 (67)</b>	<b>67 (60)</b>
<b>Construction</b>	<b>31 (31)</b>	<b>25 (23)</b>
<b>Marine</b>	<b>13 (13)</b>	<b>13 (9)</b>
<b>Manufacturing</b>	<b>11 (11)</b>	<b>13 (13)</b>
Metalworking	6	3
Manufacture of Petrochemical Products	1	3
Manufacture of Non-metallic Mineral Products	2	2
<b>Water Supply, Sewerage &amp; Waste Management</b>	<b>1</b>	<b>5</b>
<b>Logistics &amp; Transportation</b>	<b>3</b>	<b>6</b>
Services Allied To Transport of Goods	0	1
<b>Hotels &amp; Restaurants</b>	<b>2</b>	<b>0</b>
<b>Veterinary Activities</b>	<b>0</b>	<b>0</b>
<b>Landscape Care &amp; Maintenance Service Activities</b>	<b>1</b>	<b>0</b>
<b>Health Activities</b>	<b>0</b>	<b>0</b>
<b>Other Sectors</b>	<b>8</b>	<b>5</b>
Architectural & Engineering Activities	4 (1)	0
Administrative & Support Service Activities <sup>14</sup>	3	0
Wholesale & Retail Trade	1	1

Note: Figures in parenthesis refer to the number of fatal incidents.

<sup>14</sup> This excludes the Landscape Care & Maintenance Service Activities sector.

**Table 4: Workplace Fatality Rate by Industry, 2008 and 2009**

Per 100,000 employed persons

Industry	2009	2008
<b>All Sectors</b>	<b>2.9</b>	2.8
<b>Construction</b>	8.1	6.9
<b>Marine</b>	11.1	9.2
<b>Manufacturing</b>	2.6	2.9
Metalworking *	5.4	2.5
Manufacture of Petrochemical Products	2.0	6.9
Manufacture of Non-metallic Mineral Products *	42.6	40.8
<b>Water Supply, Sewerage &amp; Waste Management *</b>	10.1	52.1
<b>Logistics &amp; Transportation *</b>	3.4	6.5
Services Allied To Transport of Goods *	0	4.2
<b>Hotels &amp; Restaurants</b>	1.1	0
<b>Veterinary Activities *</b>	0	0
<b>Landscape Care &amp; Maintenance Service Activities *</b>	11.5	0
<b>Health Activities</b>	0	0
<b>Other Sectors</b>	0.7	0.5
Architectural & Engineering Activities	8.5	0
Administrative & Support Service Activities <sup>15</sup>	2.3	0
Wholesale & Retail Trade	0.2	0.2

\* Estimated Rates. The employment data excludes self-employed persons.

<sup>15</sup> This excludes the Landscape Care & Maintenance Service Activities sector.

## BY TYPE AND AGENCY OF INCIDENT

2.8 *Falls from Height* was the top incident type in both the first and second halves of 2009 (Table 5). Compared to the year before, more workers (i.e. 24 persons) lost their lives due to fatal falls in 2009, up from 19 in 2008. Falling from roofs, structures and platforms were the most common types of falls, accounting for 10 of the 24 fatalities (Table 5). *Falls from Height* was the top contributor to the 3 traditionally high risk sectors. To address this growing concern, a national Work at Height taskforce was set up in August 2009 with the aim of reducing Work at Height risks through implementing Fall Protection Plans in all workplaces by 2015<sup>16</sup>.

2.9 *Struck by falling objects* was the 2<sup>nd</sup> highest incident type, with 21 fatalities in 2009. Most of these (i.e. 14 fatalities) involved victims being struck by objects falling from heights, such as the fall of loads during lifting activities. 7 fatalities were caused by collapse / failure of structure and equipment. 4 of these were caused by collapse of structures (walls, skid beams, storage racks).

2.10 *Struck by moving objects* saw workplace fatalities halving in 2009, with 3 out of the 6 reported fatalities involving workers being hit by prime movers/trailers and a lorry. There were 5 such fatalities (involving prime movers/trailers and a roll-on bin truck) in the year before.

**Table 5: Number of Workplace Fatalities by Type of Incident, 2008 and 2009**

	2009	2008
<b>Total</b>	<b>70</b>	<b>67</b>
Falls from Height	24	19
Struck by Falling Objects	21	14
- from heights	14	6
- due to collapse /failure of structure and equipment	7	8
Struck by Moving Objects	6	12
- by prime movers/trailers/ trucks (includes lorries)	3	5
Fires and Explosion	0	5
- occurring in confined spaces	0	3

<sup>16</sup> Please refer to [http://www.mom.gov.sg/Home/Pages/Press\\_Release/20091202-PR\\_Work\\_at\\_height.html](http://www.mom.gov.sg/Home/Pages/Press_Release/20091202-PR_Work_at_height.html) for more information on the national Work at Height taskforce.

	2009	2008
Caught in/between Objects	4	4
Oxygen Deficiency in Confined Spaces <sup>17</sup>	0	4
Electrocution	2	4
Exposure / Contact with Harmful Substances	4	0
Collapse of Crane	2	3
Slips and Trips	3	2
Other Incident Types (e.g. drowning, exposure to heat)	4	0

2.11 The use of cranes was an area of concern in 2009. [Table 6](#) shows a total of 10 crane-related fatalities in 2009, twice that of the preceding year. These include 8 victims from *Construction* and 2 victims from *Marine*. Causes of incidents include the collapse of cranes (1 tower, 1 overhead), struck by falling objects during crane lifting operations (4 fatalities), falling from height (2 fatalities), electrocution (1 fatality), as well as a lightning-related incident.

2.12 There were also 8 fatalities resulting from other lifting equipment such as boom lifts and scissor lifts. Another area of concern in 2008 - confined spaces, which accounted for 7 fatalities, did not result in any death in 2009.

**Table 6: Number of Workplace Fatalities by Agency of Incident, 2008 and 2009**

Agency of Incident	2009	2008
<b>Total</b>	<b>70</b>	<b>67</b>
<b>Working Environment</b>		
Confined Spaces <sup>18</sup>	0	7
Floors/Level Surfaces	8	5

<sup>17</sup> Confined spaces refer to any chamber, tank, vat, pipe or flue where dangerous fumes are liable to be present and can result in fires, explosions or persons being overcome by the fumes or where the supply of air is inadequate, or is likely to be reduced to be inadequate for sustaining life. Works performed in confined spaces present risks uncommon to the regular workplace.

The presence of hazardous substances in confined spaces can lead to air contamination. High concentration of toxic gases such as carbon monoxide, hydrogen sulphide and petroleum solvent vapours can result in chemical poisonings or oxygen deficiency.

<sup>18</sup> This refers to all fatalities arising from accidents in confined spaces. They include cases involving the use of flammable and hazardous substances.

Agency of Incident	2009	2008
Scaffolding and Staging	1	3
Roofs	3	7
Others (i.e. structure, ladders, stairs/steps)	9	2
<b>Materials and Substances</b>		
Explosive/Flammable Substances <sup>19</sup>	0	2
Metal Items	3	5
Ceramic Items (e.g. part of the wall, granite slabs)	2	3
Other Material & Substances (e.g. fibreglass tank, glass sheets)	5	2
<b>Lifting Equipment</b>		
Cranes	10	5
Lifting Appliance/Gear	1	1
Other Lifting Equipment (e.g. boom lift)	8	2
<b>Pressurised Vessels</b>	<b>1</b>	<b>0</b>
<b>Industrial Machines</b>		
Excavators	2	2
Other Industrial Machines (e.g. milling machine, band saw, boring machine)	5	3
<b>Transport Equipment (including vehicles)</b>		
Prime Movers/Trailers	3	4
Trucks (includes lorries)	1	1
Forklift	2	3
Other Transport Equipment (e.g. van, car, coach)	0	5
<b>Electrical Equipment (e.g. spotlight and other electrical equipment)</b>	<b>1</b>	<b>4</b>
<b>Incident Agencies Not Elsewhere Classified</b>	<b>5</b>	<b>1</b>

## Construction

2.13 *Falls from Height* (FFH) remained the top killer in the *Construction* sector. The fatality numbers increased from 10 in 2008 to 11 in 2009. *Struck by Falling Objects*<sup>20</sup> (SBFO) and lifting operations were also areas of concern. In 2009, *Struck by Objects Falling from Height* and

<sup>19</sup> This refers to fatalities involving the use of explosive/flammable substances that **do not** occur in confined spaces.

<sup>20</sup> Struck by Falling Objects consists of

- Struck by Objects Falling from Height
- Collapse / Failure of Structure and Equipment

*Collapse / Failure of Structure and Equipment* accounted for nearly 30% of total *construction* fatalities (i.e. 9 deaths, 3 more than in 2008).

### Marine

2.14 *Falls from Height* (FFH) incidents contributed to the bulk of fatalities in the *Marine* sector. These include falling into the sea (3 fatalities), falling into openings (2 fatalities), and falling from an elevated height during work (2 fatalities). Similar to *Construction*, the *Marine* sector also faced risks associated with lifting activities. *Struck by Objects Falling from Height* and *Collapse / Failure of Structure and Equipment* was another leading cause of fatalities in 2009, with 4 casualties as compared to zero in the previous year.

### Manufacturing

2.15 *Falls from Height* (FFH) remained the leading incident type of workplace fatalities in *Manufacturing*, though the number of casualties fell slightly from 5 in 2008 to 4 in 2009. *Struck by Objects Falling from Height* and *Collapse / Failure of Structure and Equipment* led to 5 fatalities in 2009, an increase from 3 in 2008. *Struck by Moving Objects* decreased from 2 fatalities in 2008 to zero fatalities in 2009.

### Hotels and Restaurants; Landscape Care & Maintenance Service Activities

2.16 *Hotels and Restaurants*, which had no fatalities in 2008, saw an increase to 2 fatalities in 2009. These include an *electrocution* incident, as well as a fatality due to *slips and trips*, which reflect the working conditions in this sector, e.g. wet kitchen floors due to a lack of proper housekeeping. Similarly, the *Landscape Care & Maintenance Service Activities* sector, which had no fatalities in 2008, saw 1 fatality in 2009.

### Water Supply, Sewerage and Waste Management; Logistics & Transportation

2.17 These two sectors saw a decrease in the number of fatalities in 2009. For the *Water Supply, Sewerage and Waste Management* sector, the number of fatalities decreased from 5 in 2008 to 1 in 2009. The fatality was due to a *FFH*-related incident. For the *Logistics & Transportation* sector, the number of fatalities decreased from 6 in 2008 to 3 in 2009. Incidents involving prime movers, trailers and forklifts were more commonly seen in this sector due to the frequent use of such equipment for moving goods/materials from one location to another. It accounted for two-thirds of the fatalities.



### Other Sectors

2.18 Out of the 8 fatalities reported in this cluster, 4 involved victims who suffered from severe chemical burns due to contact with hazardous substances (nitric acid). The rest of the fatalities did not show any particular trend.

**Table 7: Number of Workplace Fatalities by Industry and Type of Incident, 2009**

	All Sectors	Construction	Marine	Manufacturing	Landscape Care & Maintenance Service	Logistics & Transportation	Water Supply, Sewerage & Waste Mgmt	Hotels & Restaurants	Other Sectors
<b>Total</b>	<b>70 (67)</b>	<b>31 (25)</b>	<b>13 (13)</b>	<b>11 (13)</b>	<b>1 (0)</b>	<b>3 (6)</b>	<b>1 (5)</b>	<b>2(0)</b>	<b>8 (5)</b>
Falls from height	24 (19)	11 (10)	7 (3)	4 (5)	0 (0)	0 (1)	1 (0)	0 (0)	1 (0)
Struck by objects falling from height	14 (6)	8 (2)	2 (0)	2 (1)	1 (0)	1 (2)	0 (0)	0 (0)	0 (1)
Collapse / failure of structure and equipment	7 (8)	1 (4)	2 (0)	3 (2)	0 (0)	1 (0)	0 (1)	0 (0)	0 (1)
Exposure to / contact with hazardous substances	4 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (0)
Struck by moving objects	6 (12)	4 (2)	0 (1)	0 (2)	0 (0)	1 (2)	0 (3)	0 (0)	1 (2)
Fires and explosions	0 (5)	0 (0)	0 (3)	0 (1)	0 (0)	0 (0)	0 (1)	0 (0)	0 (0)
Collapse of crane	2 (3)	1 (3)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Electrocution	2 (4)	1 (2)	0 (1)	0 (1)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)
Oxygen deficiency in confined spaces	0 (4)	0 (0)	0 (4)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Slips and trips	3 (2)	0 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0)	2 (1)
Caught in/between objects	4 (4)	3 (1)	0 (1)	1 (1)	0 (0)	0 (1)	0 (0)	0 (0)	0 (0)
Other incident types	4 (0)	2 (0)	1 (0)	1 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Note: Figures in parenthesis pertain to 2008 figures.

### 3. Permanent Disablements

3.1 Permanent disablements refer to non-fatal injuries which are more severe in nature, involving the complete loss, or loss of use of any member/part of a member of the injured victim's body (e.g. the amputation of an arm, a finger or the bone of a finger).

3.2 In 2009, there were 126 persons sustaining permanent injuries due to incidents at work, down from 132 the year before ([Table 9](#)). An average of 5.2 workers out of every 100,000 employed persons was permanently injured, down from 5.6 in 2008 ([Table 10](#)). Such incidents also resulted in a loss of about 21,313 man-days.

3.3 96% of the permanent disablements involved the complete loss or loss of the use of hands (including fingers) ([Table 8](#)). The remaining 4.0% were localised to the lower limb and injuries in multiple locations.

**Table 8: Number of Permanent Disablements by Body Part Injured, 2008 and 2009**

Body Part Injured	2009	2008
<b>Total</b>	<b>126</b>	<b>132</b>
<b>Upper Limb</b>	<b>121</b>	<b>123</b>
Hands (including fingers)	120	123
Shoulder/Arm	1	-
<b>Lower Limb</b>	<b>4</b>	<b>9</b>
Foot (including toes)	4	8
Leg (including ankle)	-	1
Multiple locations	<b>1</b>	-

## BY INDUSTRY

3.4 *Manufacturing* continued to be the largest contributor to permanent disablements, accounting for almost 4 in 10 (37%) of such injuries in 2009 ([Table 9](#)). This was followed by *Construction* which contributed 35% of the permanent injuries. Within the *Manufacturing* cluster, sub-sectors with the most number of permanent disablements were:

- *Metalworking*;
- *Manufacture of Food Products*;
- *Manufacture of Furniture*; and
- *Manufacture of Wood Products*.

These industries typically have high usage of machines that are potentially dangerous for workers' limbs. This include metalworking machines with moving parts like power presses, mechanical shears, circular saws, transmission machines, cranes as well as hand tools. The *Manufacture of Wood Products* sector, which has a relatively smaller workforce, recorded the highest rate among all sectors, at 90.9 per 100,000 employed persons ([Table 10](#)).

**Table 9: Number of Permanent Disablements by Industry, 2008 and 2009**

Industry	2009	2008
<b>All Sectors</b>	<b>126</b>	<b>132</b>
<b>Construction</b>	<b>44</b>	<b>35</b>
<b>Marine</b>	<b>12</b>	<b>18</b>
<b>Manufacturing</b>	<b>46</b>	<b>50</b>
Metalworking	22	21
Manufacture of Food Products	9	10
Manufacture of Furniture	3	6
Manufacture of Wood Products	3	1
<b>Water Supply, Sewerage &amp; Waste Management</b>	<b>-</b>	<b>2</b>
<b>Logistics &amp; Transportation</b>	<b>3</b>	<b>5</b>
Services Allied To Transport of Goods	2	-
<b>Hotels &amp; Restaurants</b>	<b>3</b>	<b>3</b>
<b>Veterinary Activities</b>	<b>-</b>	<b>-</b>

Industry	2009	2008
<b>Landscape Care &amp; Maintenance Service Activities</b>	-	-
<b>Health Activities</b>	-	-
<b>Other Sectors</b>	<b>18</b>	<b>19</b>
Wholesale & Retail Trade	3	5

**Table 10: Permanent Disablement Rates by Industry, 2008 and 2009**

Per 100,000 employed persons

Industry	2009	2008
<b>All Sectors</b>	<b>5.2</b>	<b>5.6</b>
<b>Construction</b>	<b>11.4</b>	<b>9.7</b>
<b>Marine</b>	<b>10.3</b>	<b>12.8</b>
<b>Manufacturing</b>	<b>10.8</b>	<b>11.2</b>
Metalworking *	19.8	17.4
Manufacture of Food products *	29.2	33.3
Manufacture of Furniture *	28.6	56.1
Manufacture of Wood products *	90.9	32.3
<b>Water Supply, Sewerage &amp; Waste Management *</b>	-	<b>20.8</b>
<b>Logistics &amp; Transportation *</b>	<b>3.4</b>	<b>5.4</b>
Services Allied To Transport of Goods *	8.7	-
<b>Hotels &amp; Restaurants</b>	<b>1.7</b>	<b>1.7</b>
<b>Veterinary Activities *</b>	-	-
<b>Landscape Care &amp; Maintenance Service Activities *</b>	-	-
<b>Health Activities</b>	-	-
<b>Other Sectors</b>		
Wholesale & Retail Trade	0.7	1.2

\* Estimated Rates. The employment data excludes self-employed persons.

## BY TYPE AND AGENCY OF INCIDENT

3.5 The majority of the permanent disablements involved hands or fingers getting caught in or between objects. In 2009, such accidents accounted for around 55% of the permanent disablements (Table 11). A further breakdown of the permanent disablement data by incident type and industry is shown in Table 12.

**Table 11: Number of Permanent Disablements by Type of Incident, 2008 and 2009**

Type of Incident	2009	2008
<b>Total</b>	<b>126</b>	<b>132</b>
Caught In / Between Objects	69	78
Struck by Falling Objects	20	22
Cut/Stabbed by Objects	16	16
Struck by Moving Objects	13	7
Other Types of Accidents	8	9

**Table 12: Number of Permanent Disablements by Industry and Type of Incident, 2008 and 2009**

Industry	Caught in/ between Objects	Struck by Falling Objects	Cut/ Stabbed by Objects	Struck by Moving Objects	Other Incident Types
<b>Total</b>	<b>69 (78)</b>	<b>20 (22)</b>	<b>16 (16)</b>	<b>13 (7)</b>	<b>8 (9)</b>
<b>Construction</b>	17 (15)	12 (9)	6 (5)	6 (2)	3 (4)
<b>Marine</b>	8 (12)	2 (4)	-	0 (2)	2 (0)
<b>Manufacturing</b>	29 (33)	4 (4)	7 (8)	5 (2)	1 (3)
<b>Water Supply, Sewerage &amp; Waste Management</b>	0 (1)	0 (1)	-	-	-
<b>Logistics &amp; Transportation</b>	2 (5)	1 (0)	-	-	-
<b>Hotels &amp; Restaurants</b>	1 (2)	-	2 (1)	-	-
<b>Landscape Care &amp; Maintenance Service Activities</b>	-	-	-	-	-
<b>Veterinary Activities</b>	-	-	-	-	-
<b>Health Activities</b>	-	-	-	-	-
<b>Other Sectors</b>	12 (10)	1 (4)	1 (2)	2 (1)	2 (2)
Wholesale & Retail Trade	3 (4)	-	0 (1)	-	-

Note: Figures in parenthesis pertain to 2008 figures.

3.6 The top few incident agencies for 2009 and 2008 were broadly similar, accounting for more than four-fifths (91%) of total permanent disablements in 2009 (Table 13). Industrial Machines made up 42% of total permanent disablements, followed by Metal Items and Hand Tools. For permanent disablements involving industrial machines, majority of the victims had their hands/fingers caught in or between the industrial machines during the course of their work, mostly due to the lack of machine guards.

**Table 13: Key Incident Agencies Leading To Permanent Disablements, 2008 and 2009**

<b>Agency of Incident</b>	<b>2009</b>	<b>2008</b>
<b>Key Incident Agencies</b>	<b>115</b>	<b>119</b>
Industrial Machines	53	61
Metal Items	20	29
Hand Tools (Electrical and Non-Electrical)	18	4
Working Environment (e.g. floor, stairs, ramp)	4	4
Scaffolding & Staging	5	0
Lifting Equipment	9	13
Transport Equipment (including vehicles)	6	8



## 4. Temporary Disablement

4.1 Temporary disablements (TD) went down by 2.2% in 2009 (Table 14). The 3 traditionally high-risk sectors made up a combined 54% of total temporary work injuries. Construction saw a slight decline of 1%, while *Manufacturing* and *Marine* saw a bigger reduction of an 8% and 13% decrease over the previous year. This coincided with the decline in work activities in *Manufacturing* and *Marine*. Among these 3 traditionally high-risk sectors, *Marine* was the only one which saw an increase in its TD rate from 377 temporary injuries per 100,000 employed persons in 2008 to 395 in 2009 (Table 15). However, *Marine* is also the only of the three sectors that has a rate that is lower than the national average of 438.

4.2 A few other sectors also accounted for significant shares of temporary work injuries, including:

- *Hotels & Restaurants* (a rise from 730 injuries in 2008 to 768 injuries in 2009, accompanied by an increase in the injury rate);
- *Logistics & Transportation* (a drop from 600 injuries in 2008 to 507 injuries in 2009, accompanied by a drop in the injury rate); and
- *Wholesale & Retail Trade* (a drop from 452 injuries in 2008 to 429 injuries in 2009, accompanied by a drop in the injury rate).

4.3 Many sectors saw a much higher rate as compared to the national rate of 438. These include the Metalworking sub-sector (rate of 1,047) as well as the Logistics and Transportation sector (rate of 573).

**Table 14: Number of Temporary Disablements by Industry, 2008 and 2009**

Industry	2009	2008
<b>All Sectors</b>	<b>10,638</b>	<b>10,873</b>
<b>Construction</b>	<b>2,778</b>	<b>2,804</b>
<b>Marine</b>	<b>462</b>	<b>531</b>
<b>Manufacturing</b>	<b>2,530</b>	<b>2,754</b>
Metalworking	1,164	1,256
Manufacture of Food, Beverages & Tobacco Products	303	322
Manufacture of Paper Products & Printing	147	190
Manufacture of Electronic Products	150	183
Manufacture of Non-metallic Mineral Products	201	164
Manufacture of Furniture	101	125
Manufacture of Rubber & Plastic Products	67	120
Manufacture of Petrochemical Products	77	100
<b>Water Supply, Sewerage &amp; Waste Management</b>	<b>69</b>	<b>73</b>
<b>Logistics &amp; Transportation</b>	<b>507</b>	<b>600</b>
Services Allied To Transport of Goods	73	65
<b>Hotels &amp; Restaurants</b>	<b>768</b>	<b>730</b>
<b>Veterinary Activities</b>	<b>S</b>	<b>S</b>
<b>Landscape Care &amp; Maintenance Service Activities</b>	<b>S</b>	<b>S</b>
<b>Health Activities</b>	<b>212</b>	<b>197</b>
<b>Other Sectors</b>	<b>3,306</b>	<b>3,180</b>
Wholesale & Retail Trade	429	452
Administrative & Support Service Activities <sup>21</sup>	184	124
Real Estate Activities	132	128
Architectural & Engineering Activities	89	120

<sup>21</sup> This includes the Landscape Care & Maintenance Service Activities sector.

Education	82	104
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S: Suppressed because the injury numbers are too small (i.e. less than 10) for meaningful analysis.

**Table 15: Temporary Disablement Rates by Industry, 2008 and 2009**

Per 100,000 employed persons

Industry	2009	2008
<b>All Sectors</b>	<b>438</b>	<b>460</b>
<b>Construction</b>	<b>722</b>	<b>779</b>
<b>Marine</b>	<b>395</b>	<b>377</b>
<b>Manufacturing</b>	<b>594</b>	<b>618</b>
Metalworking *	1,047	1,041
Manufacture of Food, Beverages & Tobacco Products	854	931
Manufacture of Paper Products & Printing	563	686
Manufacture of Electronic Products	165	177
Manufacture of Non-metallic Mineral Products *	4,277	3,347
Manufacture of Furniture *	962	1,168
Manufacture of Rubber & Plastic Products	453	719
Manufacture of Petrochemical Products	155	231
<b>Water Supply, Sewerage &amp; Waste Management *</b>	<b>697</b>	<b>760</b>
<b>Logistics &amp; Transportation *</b>	<b>573</b>	<b>653</b>
Services Allied To Transport of Goods *	316	274
<b>Hotels &amp; Restaurants</b>	<b>425</b>	<b>408</b>
<b>Veterinary Activities *</b>	<b>S</b>	<b>S</b>
<b>Landscape Care &amp; Maintenance Service Activities*</b>	<b>S</b>	<b>S</b>
<b>Health Activities</b>	<b>339</b>	<b>347</b>
<b>Other Sectors</b>		
Wholesale & Retail Trade	105	113
Real Estate Activities	195	201
Architectural & Engineering Activities	188	255

Administrative & Support Service Activities <sup>22</sup>	131	92
Education	116	159

\* Estimated rates. The employment data excludes self-employed persons.

S: Suppressed because the injury numbers are too small (i.e. less than 10) for meaningful analysis.

## BY TYPE AND AGENCY OF INCIDENT

4.4 Table 16 shows the key incident types<sup>23</sup> leading to temporary disablements. Similar to the previous year, the following 3 incident types accounted for around 41% of total temporary work injuries in 2009:

- Falls from Height (FFH);
- Struck by Falling Objects (SBFO); and
- Struck by Moving Objects (SBMO).

4.5 Certain incident types appeared to be more prevalent in specific industry sectors, reflecting the nature of work activities as well as the hazards present at the workplace (Table 17). For instance, *Falls from Height* and *Struck by Falling Objects* were more prevalent in the *Construction* sector as workers were often required to work at height or work where overhead work was performed. These two incident types were also responsible for most of the fatalities in the *Construction* sector.

4.6 For *Hotels and Restaurants* sector, temporary work injuries arising from the following types of incidents were relatively common:

- Cut or Stabbed by Objects (CSBO);
- Slips and Trips (ST); and
- Contact with Extreme Temperatures (CWET).

This is primarily because employees in this sector were exposed to working conditions such as wet kitchen floors due to a lack of proper housekeeping. There was also a high frequency of contact with sharp objects, hot liquids or utensils during food preparation.

<sup>22</sup> This includes the Landscape Care & Maintenance Service Activities sector.

<sup>23</sup> *Incident type* refers to the type of event which resulted in the injury of a victim. Where the event involves a chain of incidents, the incident type should be the one that triggered the chain of other incidents.

4.7 Slips, trips and falls were also rather prevalent in the *Health Activities* sector, especially in slippery areas such as the toilet and shower areas, or where the aisles and passageways were not free from obstruction.

**Table 16: Key Incident Types Leading To Temporary Disablements, 2008 and 2009**

Type of Incident	2009	2008
<b>Key Incident Types</b>	<b>9,678 (91.0)</b>	<b>9,952 (91.5)</b>
Falls from Height	1,632 (15.3)	1,482 (13.6)
Struck by Falling Objects	1,395 (13.1)	1,603 (14.7)
Struck by Moving Objects (excludes falling objects)	1,375 (12.9)	1,112 (10.2)
Cut or Stabbed by Objects	1,325 (12.5)	1,202 (11.1)
Caught In / Between Objects	1,290 (12.1)	1,560 (14.3)
Slips and Trips	1,214 (11.4)	1,294 (11.9)
Over-Exertion and Strenuous Movement	755 (7.1)	656 (6.0)
Strike Against Objects	692 (6.5)	1043 (9.6)

\* Figures in parenthesis refer to the % of total number of TDs.

**Table 17: Top 3 Incident Types For Temporary Disablements By Industry, 2009**

Industry	Top 3 Incident Types		
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
<b>All Sectors</b>	<b>FFH</b>	<b>SBFO</b>	<b>SBMO</b>
<b>Construction</b>	<b>FFH</b>	<b>SBFO</b>	<b>SBMO</b>
<b>Marine</b>	<b>SBFO</b>	<b>SBMO</b>	<b>CIBO</b>
<b>Manufacturing</b>	<b>CIBO</b>	<b>CSBO</b>	<b>SBMO</b>
Metalworking	CIBO	SBMO	SBFO
Manufacture of Food, Beverages & Tobacco Products	CSBO	CIBO	S&T
Manufacture of Paper Products & Printing	CIBO	CSBO	S&T
Manufacture of Electronic Products	S&T	CIBO	FFH

Manufacture of Non-metallic Mineral Products	SBFO	CIBO	SBMO
Manufacture of Furniture	CSBO	SBMO	CIBO
Manufacture of Rubber & Plastic Products	CIBO	SBFO	SBMO
Manufacture of Petrochemical Products	FFH	CIBO	CWET
<b>Water Supply, Sewerage &amp; Waste Management</b>	CIBO	S&T	SBFO
<b>Logistics &amp; Transportation</b>	FFH	SBMO	SBFO
Services Allied To Transport of Goods	FFH	CIBO	SBMO
<b>Hotels &amp; Restaurants</b>	CSBO	S&T	CWET
<b>Veterinary Activities</b>	S	S	S
<b>Landscape Care &amp; Maintenance Service Activities</b>	S	S	S
<b>Health Activities</b>	S&T	Physical Assault	OESM
<b>Other Sectors</b>			
Wholesale & Retail Trade	FFH	CSBO	OESM
Real Estate Activities	S&T	CSBO	FFH
Architectural & Engineering Activities	SBFO	CIBO	FFH
Administrative & Support Service Activities <sup>24</sup>	CSBO	FFH	SBFO
<u>S: Suppressed because the injury numbers are too small (i.e. less than 10) for meaningful analysis.</u>			
<u>Legend:</u>			
<b>CIBO</b> : Caught In/Between Objects	<b>FFH</b> : Falls from Height		
<b>SBFO</b> : Struck by Falling Objects	<b>SBMO</b> : Struck by Moving Objects <sup>25</sup>		
<b>SAO</b> : Strike Against Objects	<b>ST</b> : Slips and Trips		
<b>CWET</b> : Contact with Extreme Temperatures	<b>CSBO</b> : Cut or Stabbed by Objects		
<b>OESM</b> : Over-exertion and Strenuous Movements	<b>ETHS</b> : Exposure to Harmful Substances		

4.8 The key incident types are closely linked to the leading incident agencies<sup>26</sup>. In line with the relatively more common occurrence of slips, trips and falls, (Table 17), the following were listed as amongst the more common agencies (Table 18):

- *Floors/Level Surfaces;*
- *Ladders/Mobile Ramps;*
- *Stairs/Steps; and*
- *Scaffolding/Staging.*

<sup>24</sup> This includes the Landscape Care & Maintenance Service Activities sector.

<sup>25</sup> This includes flying fragments but excludes falling objects.

<sup>26</sup> Incident agency refers to the object or physical environment, which due to its hazardous nature/condition, leads to the occurrence of a particular type of incident. It is related to the incident, not injury.

Together, they accounted for close to a quarter (23%) of total temporary injuries reported. The lack of proper housekeeping and also inadequate protection for work at heights have made site conditions more hazardous, thus increasing one's likelihood of getting injured at work.

4.9 Similarly, improper handling of *metal items, industrial machines* and *hand tools* has made them common agencies of incidents. Unsafe work practices and the absence of machine guarding were amongst the factors which made one more prone to these hazards at the workplaces.

**Table 18: Key Incident Agencies Leading To Temporary Disablements, 2008 and 2009**

Agency of Incident	2009	2008
<b>Key Accident Agencies</b>	<b>7,927 (74.5)</b>	<b>7,458 (68.6)</b>
Metal Items	1,944 (18.3)	1,274 (11.7)
Floors or Level Surfaces	1,439 (13.5)	1,703 (15.7)
Industrial Machines	1,094 (10.3)	1,236 (11.4)
Hand Tools (both electrical and non-electrical)	1,000 (9.4)	1,075 (9.9)
Transport Equipment or Vehicles	796 (7.5)	601 (5.5)
Lifting Equipment	451 (4.2)	465 (4.3)
Ladders, Mobile Ramps	372 (3.5)	323 (3.0)
Stairs and Steps	359 (3.4)	306 (2.8)
Scaffolding and Staging	257 (2.4)	223 (2.1)
Wooden Items	215 (2.0)	252 (2.3)

\* Figures in parenthesis refer to the % of total number of TD.

## 5. Occupational Diseases

5.1 In 2009, there were 468 confirmed cases of occupational diseases (OD), some 45% less than the year before (Table 19). The overall OD incidence stood at 19.3 cases per 100,000 employed persons, down from 36.2 cases posted in 2008 (Table 20). Noise-induced deafness cases saw close to a 50% reduction. Meanwhile, ongoing efforts through the NID Prevention Programme have raised awareness on hearing protection in noisy workplaces and may have helped to reduce the number of NID cases reported due to better ear protection.

### BY INDUSTRY

5.2 *Manufacturing* continued to be the largest contributor for OD cases, accounting for 285 cases (61%) of total cases confirmed (Table 19). Within this cluster, close to 75% of the ODs confirmed, specifically the NID, were from the *Metalworking* and *Manufacture of Transport Equipment*<sup>27</sup> sub-sectors. *Manufacture of Transport Equipment* also posted the highest OD incidence among all sectors (at 333 cases for every 100,000 employed persons) (Table 20).

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<sup>27</sup> This excludes all shipbuilding and ship repair activities.



**Table 19: Number of Confirmed Occupational Diseases by Industry, 2008 and 2009**

<b>Industry</b>	<b>2009</b>	<b>2008</b>
<b>All Sectors</b>	<b>468</b>	<b>855</b>
<b>Construction</b>	<b>31</b>	<b>56</b>
<b>Marine</b>	<b>29</b>	<b>75</b>
<b>Manufacturing</b>	<b>285</b>	<b>565</b>
Metalworking	144	244
Manufacture of Transport Equipment	70	198
Manufacture of Petrochemical Products	13	29
Manufacture of Medical & Precision Instruments	11	3
Manufacture of Paper Products & Printing	9	15
Manufacture of Rubber & Plastic Products	8	21
Manufacture of Food, Beverages & Tobacco Products	8	19
Manufacture of Electronic Products	5	18
<b>Water Supply, Sewerage &amp; Waste Management</b>	<b>3</b>	<b>7</b>
<b>Logistics &amp; Transportation</b>	<b>56</b>	<b>64</b>
Services Allied To Transport of Goods	-	-
<b>Hotels &amp; Restaurants</b>	<b>7</b>	<b>10</b>
<b>Veterinary Activities</b>	<b>-</b>	<b>-</b>
<b>Landscape Care &amp; Maintenance Service Activities</b>	<b>-</b>	<b>-</b>
<b>Health Activities</b>	<b>5</b>	<b>7</b>
<b>Other Sectors</b>	<b>52</b>	<b>71</b>
Repair & Maintenance of Motor Vehicles	14	26
Hairdressing & Other Beauty Treatment	10	1

**Table 20: Occupational Disease Incidence by Industry, 2008 and 2009**

Per 100,000 employed persons

Industry	2009	2008
<b>All Sectors</b>	<b>19.3</b>	<b>36.2</b>
<b>Construction</b>	<b>8.1</b>	<b>15.6</b>
<b>Marine</b>	<b>24.8</b>	<b>53.2</b>
<b>Manufacturing</b>	<b>67.0</b>	<b>126.9</b>
Metalworking *	129.5	202.3
Manufacture of Transport Equipment	333.3	908.3
Manufacture of Petrochemical Products	26.2	67.1
Manufacture of Rubber & Plastic Products	54.1	125.7
Manufacture of Food, Beverages & Tobacco Products	22.5	54.9
Manufacture of Paper Products & Printing	34.5	54.2
Manufacture of Electronic Products	5.5	17.4
<b>Water Supply, Sewerage &amp; Waste Management *</b>	<b>30.3</b>	<b>72.9</b>
<b>Logistics &amp; Transportation *</b>	<b>63.3</b>	<b>69.6</b>
Services Allied To Transport of Goods *	-	-
<b>Hotels &amp; Restaurants</b>	<b>3.9</b>	<b>5.6</b>
<b>Veterinary Activities *</b>	-	-
<b>Landscape Care &amp; Maintenance Service Activities *</b>	-	-
<b>Health Activities</b>	<b>8.0</b>	<b>12.3</b>
<b>Other Sectors</b>		
Repair & Maintenance of Motor Vehicles	Not Available	Not Available
Hairdressing & Other Beauty Treatment	Not Available	Not Available

\* Estimated Rates. The employment data excludes self-employed persons.

## BY TYPE OF OCCUPATIONAL DISEASE

### Noise-induced Deafness (NID)

5.3 Noise-induced deafness (NID) made up approximately 8 out of 10 OD cases (81%) confirmed in 2009, marking a smaller share than the 87% in 2008. Table 21 shows that 375 out of 380 NID cases were diagnosed in the early stage of the disease while 5 workers suffered from severe hearing loss. Apart from *Metalworking* and *Manufacture of Transport Equipment* which made up the majority of the NID cases, other sectors with notable number of NID cases include (Table 22) :

- *Logistics & Transportation* ( 54 cases); and
- *Marine* (24 cases).

**Table 21: Number of Confirmed Occupational Diseases by Type, 2008 and 2009**

Type of Occupational Diseases	2009	2008
<b>Total</b>	<b>468</b>	<b>855</b>
Noise- induced Deafness (NID)	380	743
- <i>Early Stage</i>	375	741
- <i>Advanced Stage</i>	5	2
Occupational Skin Diseases	56	66
Excessive Absorption of Chemicals	16	11
Chemical Poisoning	-	8
Compressed Air Illness	-	7
Barotrauma	1	5
Occupational Lung Diseases	3	5
Work-related Musculoskeletal Disorders	3	5
Mesothelioma	3	4
Others	6	1

**Table 22: Number of Confirmed NIDs in Selected Industries, 2008 and 2009**

Industry	2009	2008
<b>All Sectors</b>	<b>380</b>	<b>743</b>
<b>Construction</b>	<b>14</b>	<b>33</b>
<b>Marine</b>	<b>24</b>	<b>70</b>
<b>Manufacturing</b>	<b>256</b>	<b>528</b>
Metalworking	133	235
Manufacture of Transport Equipment	68	194
Manufacture of Petrochemical Products	10	25
Manufacture of Paper Products & Printing	9	13
Manufacture of Rubber & Plastic Products	8	21
Manufacture of Medical & Precision Instruments	7	2
Manufacture of Food, Beverages & Tobacco Products	5	15
Manufacture of Electronic Products	4	11
<b>Water Supply, Sewerage &amp; Waste Management</b>	<b>3</b>	<b>7</b>
<b>Logistics &amp; Transportation</b>	<b>54</b>	<b>61</b>
Services Allied To Transport of Goods	-	-
<b>Hotels &amp; Restaurants</b>	<b>-</b>	<b>-</b>
<b>Veterinary Activities</b>	<b>-</b>	<b>-</b>
<b>Landscape Care &amp; Maintenance Service Activities</b>	<b>-</b>	<b>-</b>
<b>Health Activities</b>	<b>1</b>	<b>-</b>
<b>Other Sectors</b>	<b>28</b>	<b>44</b>
Repair & Maintenance of Motor Vehicles	14	26

### Occupational Skin Diseases (OSD)

5.4 56 cases of occupational skin diseases (OSD) were confirmed in 2009, down from 66 cases in the previous year (Table 23). Ranked in the distant 2<sup>nd</sup> position from NID, OSD accounted for approximately 12% of total ODs. *Construction* and *Manufacturing* were the largest contributors of OSD cases in 2009 with 15 confirmed cases each. *Construction* reported 15

confirmed OSD cases in 2009, up from 10 cases in the previous year. *Manufacturing*, which was the largest contributor of OSD cases in 2008, saw a drop of 7 cases confirmed in 2009. Among its sub-sectors, there was an increase in cases from *Metalworking*, 6 in 2009 as compared to 4 in the preceding year. There were also 5 cases from *Hotels and Restaurants*.

**Table 23: Number of Confirmed OSD by Industry, 2008 and 2009**

Industry	2009	2008
<b>All Sectors</b>	<b>56</b>	<b>66</b>
<b>Construction</b>	<b>15</b>	<b>10</b>
<b>Marine</b>	<b>3</b>	<b>3</b>
<b>Manufacturing</b>	<b>15</b>	<b>22</b>
Metalworking	6	4
Manufacture of Food, Beverages & Tobacco Products	3	3
Manufacture of Transport Equipment	2	3
Manufacture of Petrochemical Products	2	1
Manufacture of Medical & Precision Instruments	1	1
Manufacture of Electronic Products	1	4
Manufacture of Paper Products & Printing	-	2
Manufacture of Non-metallic Mineral Products	-	2
<b>Water Supply, Sewerage &amp; Waste Management</b>	<b>-</b>	<b>-</b>
<b>Logistics &amp; Transportation</b>	<b>-</b>	<b>-</b>
Services Allied To Transport of Goods	-	-
<b>Hotels &amp; Restaurants</b>	<b>5</b>	<b>9</b>
<b>Veterinary Activities</b>	<b>-</b>	<b>-</b>
<b>Landscape Care &amp; Maintenance Service Activities</b>	<b>-</b>	<b>-</b>
<b>Health Activities</b>	<b>2</b>	<b>7</b>
<b>Other Sectors</b>	<b>16</b>	<b>15</b>
Hairdressing & Other Beauty Treatment	10	1

5.5 As seen from Table 24, the most common agents resulting in OSD were :

- Cement (12 cases);
- Wet work and detergents (11 cases); and
- Occlusion (6 cases).

The bulk of the OSD cases involving cement were from *Construction* (11 cases) where employees are more frequently in touch with such agents in the course of their work. OSD cases involving wet work and detergents were from *Manufacturing* (5 cases) and *Hotels and Restaurants* (3 cases). There are also salon and spa workers from the *Hairdressing & Other Beauty Treatment* sector who developed skin rash due to contact with various chemicals such as essential oils, creams and lotions and from frequent washing of their hands in the course of their work.

**Table 24: Top 5 Causative Agents of Occupational Skin Diseases, 2009**

Causative Agents	No. of Cases
Cement	12
Wet work and detergents	11
Occlusion	6
Oils	5
Cosmetics and toiletries	5

### **Other Occupational Diseases**

5.6 There were 16 cases of excessive absorption of chemicals in 2009, up from 11 such cases in 2008. However, there were no cases of chemical poisoning in 2009, a significant reduction from 8 cases in 2008.

5.7 Of the 16 excessive absorption cases, 11 involved excessive perchloroethylene (PCE) absorption. 5 of them were from a manufacturer of gold chains, 3 from a manufacturer of electrical motors, 2 from the marine industry and 1 from electroplating. In all these cases, the PCE was used for degreasing.

**Table 1-1: Accident Frequency Rate (AFR) and Accident Severity Rate (ASR) in Selected Sectors, 2008 and 2009**

Per million man-hours worked

Industry	AFR		ASR	
	2009	2008	2009	2008
<b>All Sectors</b>	1.8	1.9	112	112
<b>Construction</b>	2.7	2.9	247	221
<b>Marine<sup>28</sup></b>	1.4	1.4	274	236
<b>Manufacturing (excluding Marine)</b>	2.4	2.5	115	127
Manufacture of Petrochemical Products	0.6	1.0	64	225
Metalworking	4.0	4.0	208	135
Manufacture of Food, Beverages & Tobacco Products	3.6	4.0	84	152
Manufacture of Wood Products	5.7	5.1	854	863
Manufacture of Rubber & Plastic Products	1.8	2.9	31	234
Manufacture of Non-metallic Mineral Products	15.1	12.7	1,263	1,208
Manufacture of Medical & Precision Equipment	0.7	0.6	11	163
<b>Water Supply, Sewerage &amp; Waste Management</b>	2.9	3.5	317	1,395
<b>Logistics &amp; Transportation<sup>29</sup></b>	2.4	2.8	138	221
Services Allied To Transport of Goods	1.2	1.1	29	123
<b>Hotels &amp; Restaurants</b>	2.0	1.9	58	26
Hotels	4.9	5.0	158	69
<b>Real Estate Activities</b>	0.8	0.9	13	96
<b>Veterinary Activities</b>	S	S	S	S
<b>Landscape Care &amp; Maintenance Service Activities</b>	S	S	S	S
<b>Health Activities</b>	1.5	1.6	33	25

S: Suppressed because the injury numbers are too small (i.e. less than 10) for meaningful analysis.

<sup>28</sup> The Marine sector covers the following activities :

- Shipbuilding and ship repair
- Marine surveying services (other than classification societies)
- Salvaging of distressed vessels and cargo

Works carried out at the anchorage are also included.

<sup>29</sup> The Logistics & Transportation sector covers the following activities :

- Storage and Warehousing
- Supporting Services To Land Transport (excludes car management services, services allied to transport of passengers and towing services)
- Supporting Services To Water Transport (excludes marine surveying services and salvaging of distressed vessels and cargo)
- Supporting Services To Air Transport
- Services Allied To Transport of Goods
- Services Allied To Transport of Goods Not Elsewhere Classified.



**Table 1-2: Number of Man-days Lost To Workplace Incidents<sup>30</sup> in Selected Sectors, 2008 and 2009**

Industry	2009	2008
<b>All Sectors</b>	663,657	642,545
<b>Construction</b>	258,421	216,030
<b>Marine</b>	91,077	93,027
<b>Manufacturing</b>	125,837	140,515
Metalworking	62,187	42,970
Manufacture of Petrochemical Products	7,663	22,829
Manufacture of Food, Beverages & Tobacco Products	7,345	12,649
Manufacture of Wood Products	7,475	7,098
Manufacture of Rubber & Plastic Products	1,187	9,892
Manufacture of Non-metallic Mineral Products	16,951	16,222
Manufacture of Medical & Precision Equipment	451	6,577
<b>Water Supply, Sewerage and Waste Management</b>	7,430	31,746
<b>Logistics &amp; Transportation</b>	29,307	48,756
Services Allied To Transport of Goods	1,796	7,350
<b>Hotels &amp; Restaurants</b>	22,351	10,259
Hotels	9,944	4,351
<b>Real Estate Activities</b>	2,071	14,071
<b>Veterinary Activities</b>	-	S
<b>Landscape Care &amp; Maintenance Service Activities</b>	6,160	72
<b>Health Activities</b>	4,429	3,145

S: Suppressed because the numbers are too small (i.e. less than 10) for meaningful analysis.

<sup>30</sup> According to the U.S National Institute of Occupational Safety and Health (NIOSH)'s table of scheduled charges, a fatality is equivalent to the loss of 6000 man-days. The Ministry of Manpower adopts a similar coding schedule.

## ANNEX 2

### SOURCE OF DATA

Data on workplace injuries and occupational diseases were collected from incident reports made by employers, occupiers and medical practitioners in the fulfilment of their obligations under the Workplace Safety and Health (Incident Reporting) Regulations.

Employment data used for the computation of workplace fatality and injury rates are from the administrative records maintained by the Central Provident Fund (CPF) Board and Work Pass Division, Ministry of the Manpower.

Average weekly hours worked data used for the estimation of man-hours worked are from the Quarterly Labour Market Survey conducted by the Ministry of Manpower.

### DATA COVERAGE

The types of workplace injuries and occupational diseases covered in the reported statistics include the following:

- Workplace injuries sustained by employees and resulting in more than 3 consecutive days of medical leave;
- Workplace injuries sustained by employees and resulting in at least 24 hours of hospitalisation;
- Workplace incidents resulting in the death of employees, self-employed persons and persons not at work;
- Workplace incidents resulting in the injury of self-employed persons and persons not at work who have to be taken to the hospital for treatment; and
- Occupational diseases listed in the Third Schedule of the Workplace Safety and Health Act.

### CONCEPTS AND DEFINITIONS

**Incident Type** refers to the type of event which resulted in the injury of a victim. Where the event involves a chain of incidents, the incident type should be the one that triggered the chain of other incidents.

**Incident Agency** refers to the object or physical environment, which due to its hazardous nature/condition, leads to the occurrence of a particular type of incident. It is related to the incident, not injury.

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#### Annex I Table 1-1:

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#### Annex I Table 1-2:

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