



SAFETY BULLETIN 25/21

WORKPLACE SAFETY

ASIA INDUSTRIAL GASES ASSOCIATION

No 2 Venture Drive, # 22-28 Vision Exchange, Singapore 608526

Tel: +65 67055642 Fax: +65 68633307

Internet: <http://www.asiaiga.org>

Workplace Safety

(Scope: AIGA Members Only)

1. Workplace Safety

Safety is fundamental for any profitable and responsible company in the industry; this is especially true for the gas industry where each product we handle has their inherent hazard.

In order to better understand the causes of Occupational Safety injuries, in 2017, the Safety Advisory Group of AIGA began to request the member companies to provide detailed information of the Occupational safety related injuries suffered by employees and contractors in their respective Organizations. These include the listing of the injured body parts, related business areas, products involved along with the key incident causes.

This document presents analysis findings along with observations and some improvement recommendations from the analysis of workplace injuries suffered by employees and contractors of the member companies since 2017.

Definitions:

Lost-Time Injury (LTI): A work related injury or illness resulting in unfitness for work and the employee's absence beyond the day of the accident. Also referred to as a Lost Workday Case.

Recordable Injury (RI): Any work-related injury or illness that requires more than first aid treatment and/or results in loss of consciousness, restriction of work motion or transfer to another job.

Fatality: A fatal work accident is defined as any accident leading to death within one year of the accident.

This report excludes the injuries from product vehicle incidents on the road.

1.1 Indicators Dashboard

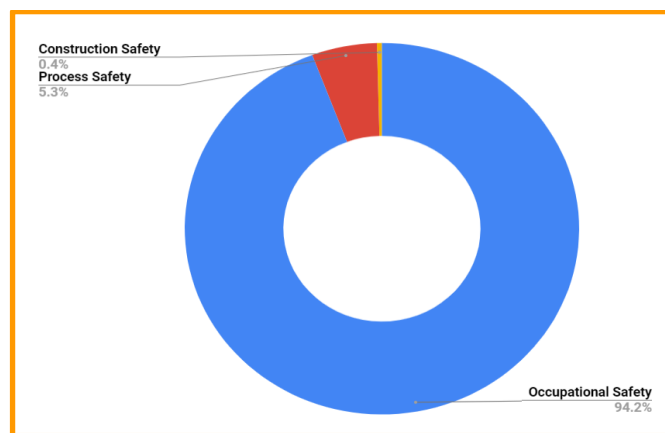
Indicators	2018 Full year	2019 Full year	2020 Full year
Number of Recordable Injuries	91	67	71
Recordable Injury Rate (Calculated Per 200,000 Man Hours)	0.20	0.15	0.16

Number of Lost Time Injuries	44	45	39
Lost Time Injury Rate (Calculated Per 200,000 Man Hours)	0.10	0.10	0.09
No. of Fatality	1	0	3*
Perm. Total Disability	-	-	-

* 2 Contractor employees

2. Workplace Safety – Statistics:

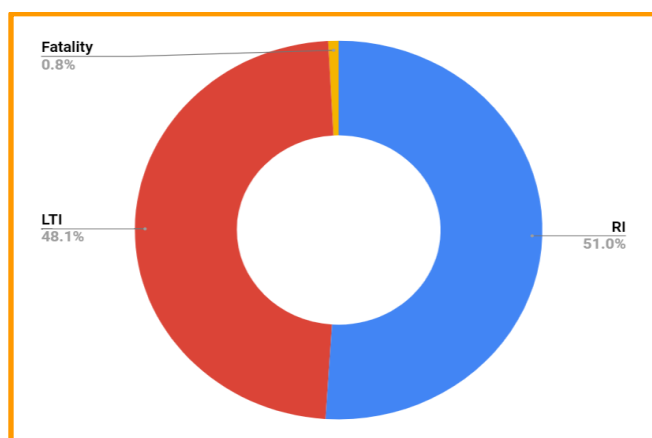
2.1. Analysis by Incident Domain:



Of all the work place injuries, 94.2% of them are contributed by Occupational Safety incidents.

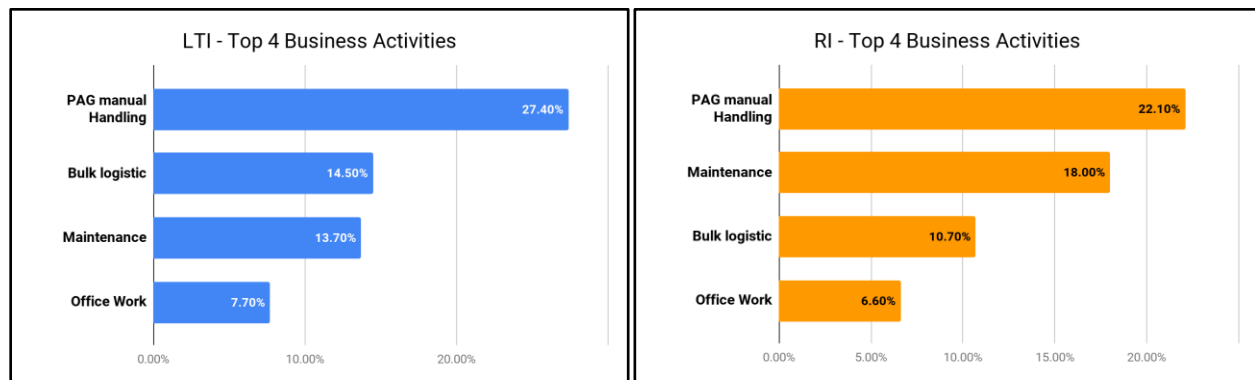
While process safety incidents are less common than Occupational Safety incidents, their potential consequences are likely to be more severe. Thus, Process Safety is one of the focus areas of AIGA and creating awareness through publications, safety posters and webinars, etc.

2.2. Analysis by Classification of Incidents:



Fatal accidents in Workplace are rare; 99.2% of the events resulted in either a Recordable Injury (RI) or Lost Time Injury (LTI).

2.3. Analysis by Business Activity:



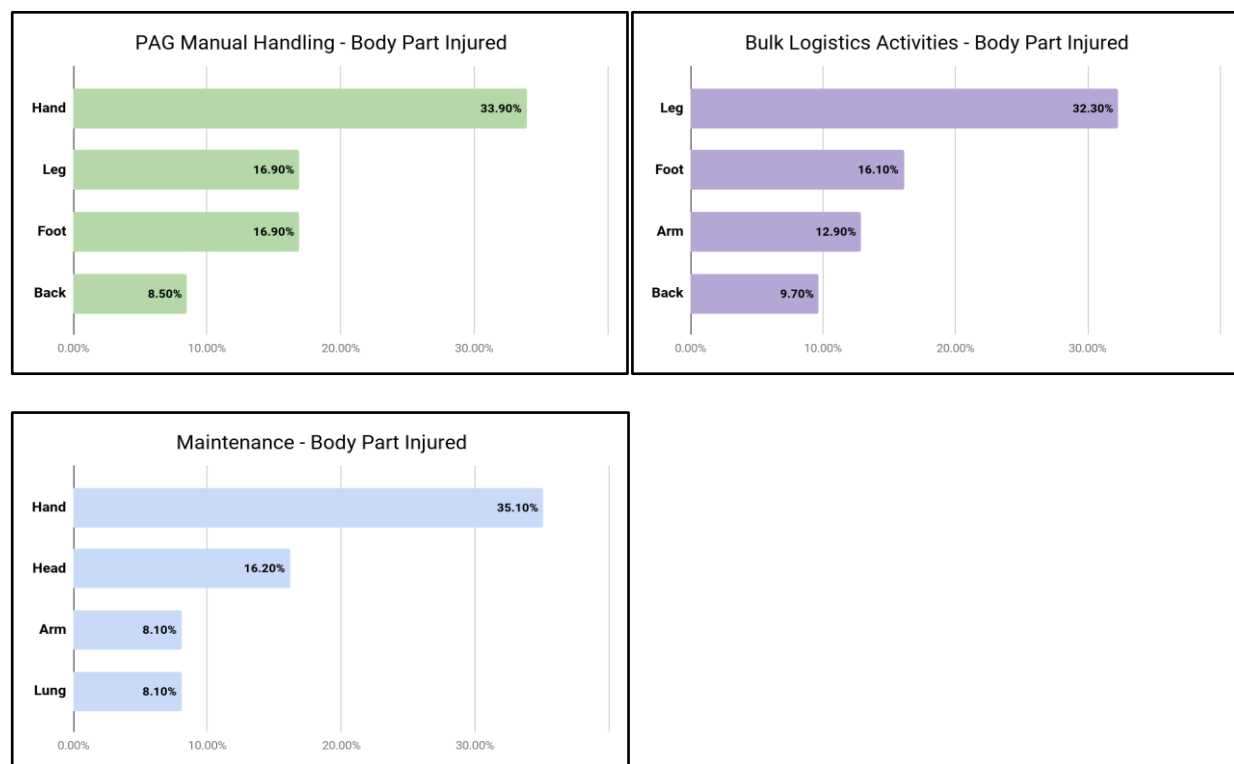
The above graph shows the percentage of reported injuries contributed by different business activities.

PAG (Packaged Gases) Manual Handling in particular resulted in more than 20% of both LTI and RI. Workers in PAG Manual Handling, Bulk Logistics and Maintenance contributing to 50% of both LTI and RI.

This is not surprising, activities involving frequent manual handling are more likely to suffer a workplace injury than workers in an Office or ASU plant.

Note: Bulk Logistics here excludes injuries due to vehicular accidents.

2.4. Analysis by injured Body Parts:



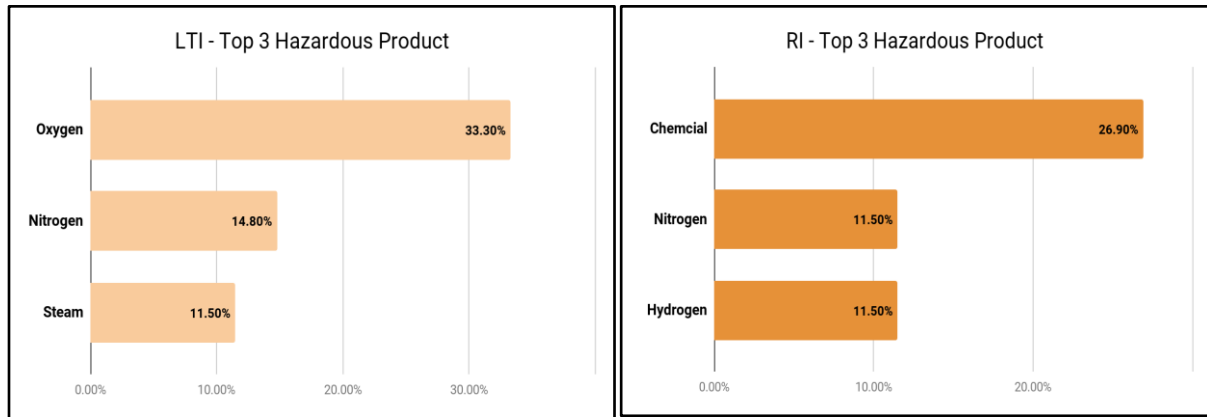
These charts show the body part injured in both LTI and RI for the Business Activities: PAG Manual Handling, Bulk Logistics and Maintenance.

Hand and leg injuries in PAG Manual Handling are mainly contributed by falling cylinders.

Most common injuries in Bulk Logistics activities are Leg / foot and arm injuries. They are mainly contributed by slip, trip or fall; usually due to poor visibility or housekeeping.

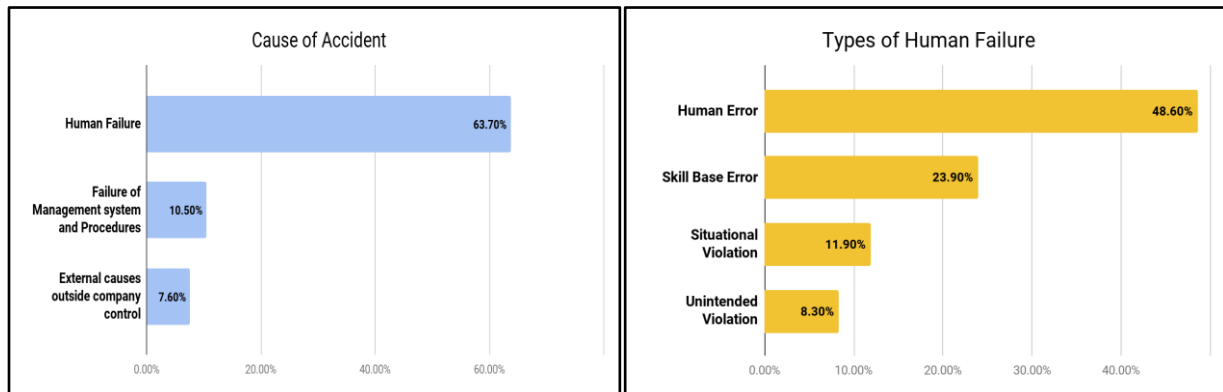
Note: Bulk Logistics here excludes injuries due to vehicular accidents.

2.5. Analysis by Hazardous Product:

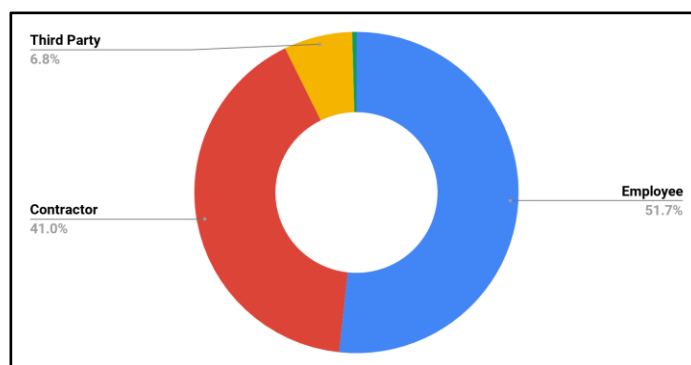


Typical injuries of the products are Burn in the case of Hydrogen, Oxygen & Steam and Asphyxiation in the case of Nitrogen.

2.6. Analysis by Causes:



2.7. Category of Injured Person:



The above chart shows the categories of injured person. 41 % of injured person are contractors and about 51% of injured are employees.

3. Workplace Safety - Priorities & Mitigation Measures:

Packaged Gas Manual Handling:

Gas cylinders / containers are heavy and, depending on their size are difficult to handle. It is important that strict guidelines are followed, given that the gas cylinders are under high pressure and may contain hazardous gases.

The following best practices may prevent injuries during manual handling of packaged gas products:

- Never try to catch a falling gas cylinder.
- Do not roll two gas cylinders at the same time.
- Secure cylinders at all times.
- Always take care not to trap your fingers between the cylinders.
- Avoid as far as possible manual handling of gas cylinders; use mechanical aids (gas cylinder trolleys, forklifts, etc.) if possible.
- Follow established work procedures and practices.
- Ensure the access areas and ground surface is in good condition (no uneven surfaces or slopes) prior to moving the cylinders.

Personal Protective Equipment (PPE) selection and application:

After all the engineering and administrative controls have been exhausted, PPE is the last line of defence to protect personnel from injuries. Choosing the appropriate PPE and wearing it properly will help prevent injuries.

Some of the common PPEs are:

- Cryogenic Gloves - Cryogenic product handling
- Metatarsal protection safety shoes - Cylinder handling
- Chemical apron, gloves, rubber boots, face shields, etc., while handling chemicals

In addition, it is important that clear instructions, procedures, training are provided to ensure that the PPEs are effectively used.

Employees and Contractors safety awareness:

From the statistics, incidents are mainly caused by Human errors and skill based errors. Safety awareness and work procedures training for employees and contractors are essential for preventing workplace injuries.

- Product hazards
- Risk associated with the task / job and their mitigation measures
- Selection and use of PPE
- Importance of good housekeeping
- Work procedures

Contractors Management:

The following are recommendations on how to plan and safely execute contracted work:

- When selecting a contractor, take into consideration of the criticality of the work and possible experience of contractors in earlier contracts, qualification, training, HSE performance, HSE certification.
- Evaluate the ability of the contractor to perform the work and then to adjust the HSE requirement accordingly.
- Ensure that all local HSE requirements regarding the selection of contractors are applied.

- For activities under the contractor's control, contractor shall be required to produce a written detailed risk assessment of the work activities the complexity will depend on the level of risk of the work.
- Specific PPE required during work shall be defined after the full risk assessment of the work has been performed.
- Maintain effective and regular communications throughout the course of the work.

4. Conclusion:

Workplace Safety is important because it protects the wellbeing of employees, contractors, visitors and customers. It is recognized by AIGA member companies as an important safety domain to improve on.

AIGA will continue to:

- Collect and analyse Occupational safety incidents information from the member companies
- Publish Training Package on Accidents/Incidents in Gases Industry in Asia
- Organize Webinars to share best practices.

5. References:

1. AIGA 046: *Work Injury and Product Vehicle Accident Statistics*
2. AIGA 066: *Selection of Personal Protective Equipment*
3. AIGA 015: *Safe Management of Contractors*

Disclaimer

All technical publications of AIGA or under AIGA's name, including Codes of practice, Safety procedures and any other technical information contained in such publications were obtained from sources believed to be reliable and are based on technical information and experience currently available from of AIGA and others at the date of their issuance.

Where AIGA recommends reference to or use of its publications by its members, such reference to or sue of AIGA's publications by its members or third parties are purely voluntary and not binding.

Therefore, AIGA or its members make no guarantee of the results and assume no liability or responsibility in connection with the reference to or use of information or suggestions contained in AIGA's publications.

AIGA has no control whatsoever as regards, performance or non-performance, misinterpretation, proper or improper use of any information or suggestions contain in AIGA's publications by any person or entity (including AIGA members) and AIGA expressly disclaims any liability in connection thereto.

AIGA's publications are subject to periodic review and users are cautioned to obtain the latest edition.

©AIGA 2021: *Not to be Reproduced without permission from Asia Industrial Gases Association. All Rights Reserved.*