Training Package
TP 14/15

Recent (2014) Incidents in the Gases Industry in Asia

AIGA *Asia Industrial Gases Association*

3 HarbourFront Place #09-04 HarbourFront Tower 2
Singapore 099254 Internet: http://www.asiaiga.org

Recent Incidents in the Gases Industry in Asia

Disclaimer

All publications of AIGA or bearing AIGA's name contain information, including Codes of Practice, safety procedures and other technical information that were obtained from sources believed by AIGA to be reliable and/ or based on technical information and experience currently available from members of AIGA and others at the date of the publication. As such, we do not make any representation or warranty nor accept any liability as to the accuracy, completeness or correctness of the information contained in these publications.

While AIGA recommends that its members refer to or use its publications, such reference to or use thereof by its members or third parties is purely voluntary and not binding.

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 contained 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.

Introduction

At the regular Safety Advisory Group (SAG) meetings, members exchange information on accidents/incidents that have occurred . Accident/Incident details discussed at the SAG remain confidential.

The SAG has decided to share the more notable accidents/incidents on a regular basis with the national associations and member companies via the Training Package publications.

These slides contain the summaries, pictures and other relevant information to highlight the root causes and lessons to be learned.

Further Information:

These Training Packages are posted only on the Members Page and are meant for distribution among Members only.

While the best effort is made to provide sufficient information on the accidents/incidents, please contact the SAG (through the Secretary General) if you need further clarifications.

Content

Section A:

- Incidents involving Transportation and Traffic

Section B:

- Maintenance Incidents

Section C:

- Incidents Involving Delivery of Gas and Liquid Cylinders

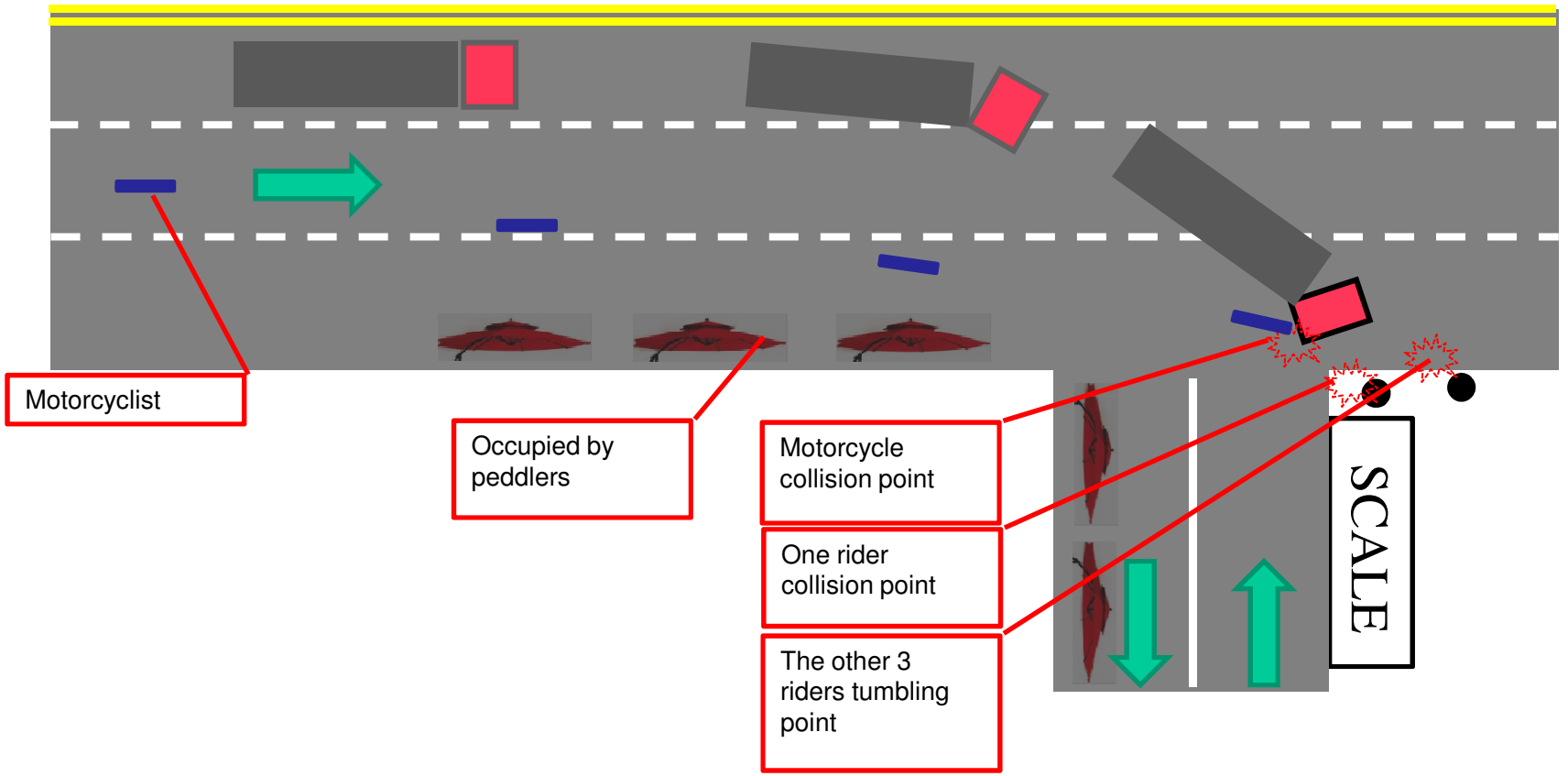
Section A: Incidents Involving Transportation and Traffic

Case 1
Product Vehicle Accident with 3rd party injury

What happened:

- A motorcycle rode by 4 adults hit the distribution vehicle truck cabin when the driver was steering to right to get into a public weigh scale. One rider suffered a serious injury.

Incident Pictures



Cause(s) of incident

- Distribution vehicle turned from the most left lane invading the right of way of the motorcycle. Only from that lane the vehicle can turn in order to get into the scale
- Less Than Adequate hazard identification during route selection.

Key lessons and Preventive Measures

- Potential of accident due to scale location was not evaluated during route assessment.
- Drivers were not notified about the condition.
- Lane invasion for getting into the truck scale was not as per traffic regulations
- Improve route assessment criteria

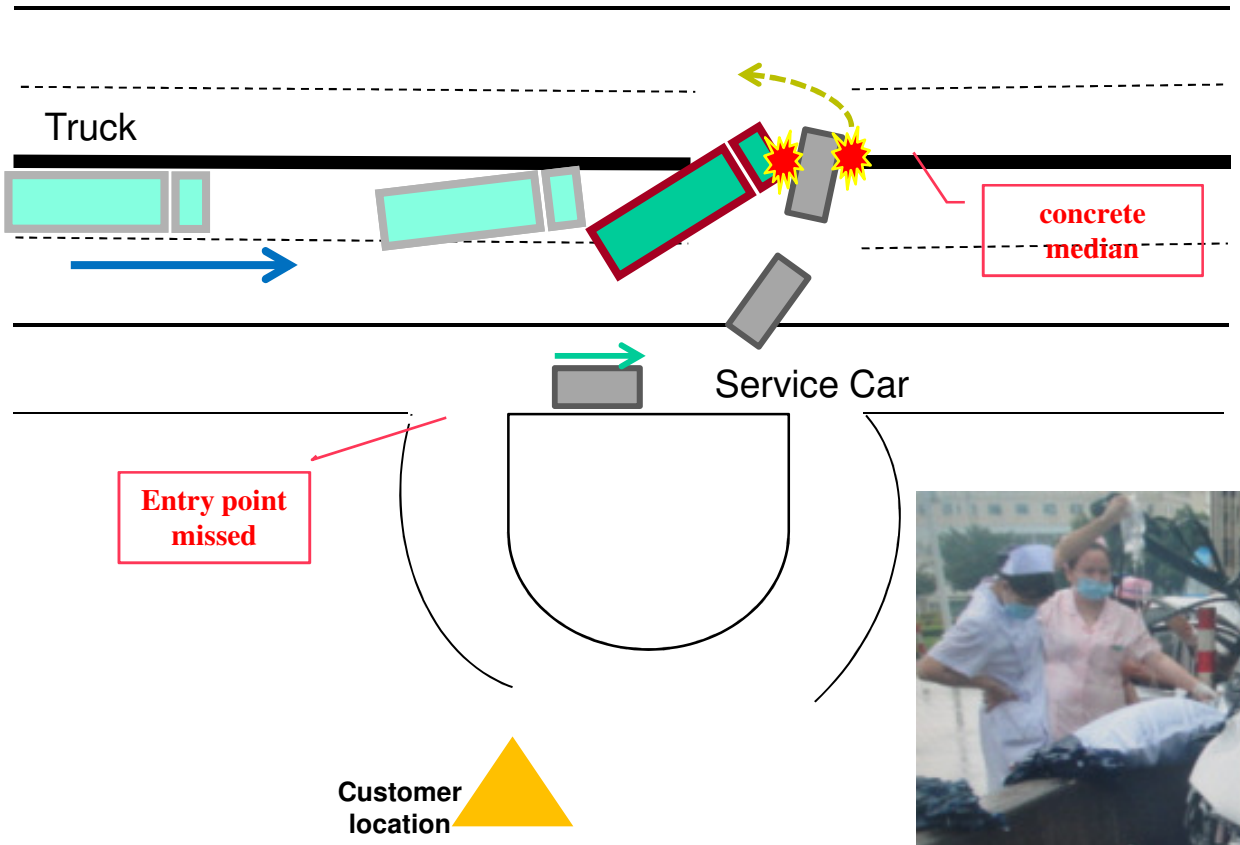
NOT FOLLOWING TRAFFIC REGULATIONS

Case 2
Lost Time Injury caused by a service vehicle accident

What happened:

- While making a “U” turn (legal one) from the right lane, by cutting across the lane to extreme left. The service car was impacted by a truck. 2 employees were seriously injured.

Incident Pictures



Cause(s) of incident

- Vehicle invaded/obstructed the right of way of the truck.
- Less Than Adequate identification of the risk performing the maneuver.
- Making the "U" turn not as per traffic regulations (“U”-turn is only allowed from the left side)
- Inadequate driving experience

Key lessons and Preventive Measures

- Employee was not experienced enough in driving.
- Minimize "U" turns or any other maneuver in which road lanes might be obstructed, only making them in places where is expressly allowed by traffic lights or road signals.

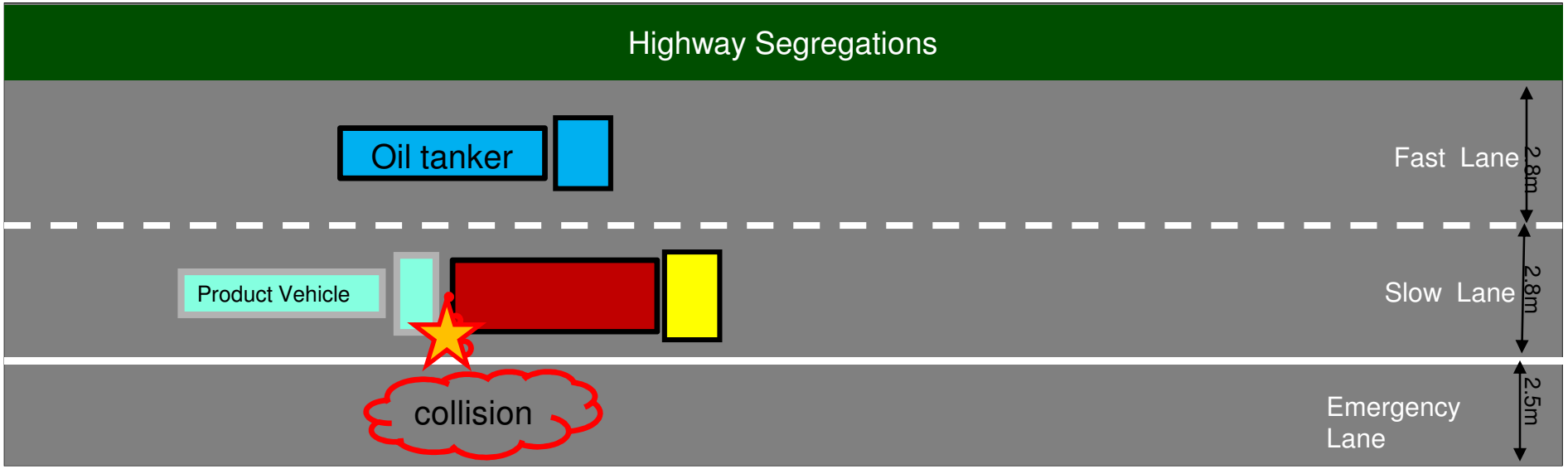
NOT FOLLOWING TRAFFIC REGULATIONS

Case 3
Product Vehicle Accident in vehicle rear ending

What happened:

- While driving on a highway the driver rear ended another truck. Product vehicle was seriously damaged. No personnel injuries, no product loss.

Incident Pictures



Cause(s) of incident

- Driver's fatigue.
- Supervisor assumed driver was well rested (Driver was returning from a long leave)
- Less Than Adequate enforcement of 'fit for duty' and fatigue management program.

Key lessons and Preventive Measures

- Never assume !
- Verify fitness for duty – Some drivers may need a rest day after returning from a long leave
- Ensure good fatigue management and 'fit for duty' program.

Ensure good Driver Fatigue Management

Case 4:
Driver fatality in rear ending incident

What Happened:

- A company owned bulk product vehicle rear ended a third party truck on the motorway. The driver of the product vehicle died from injuries and the helper suffered a collarbone fracture. Also the driver cabin of the truck received extensive damage.

Incident Pictures

Cause(s) of incident

- Inadequate driver fatigue management
- Less than adequate management control. The planned trip time was much longer than actual due to route change as a result of route diversion .

Key lessons and Preventive Measures

- Improved monitoring of rest breaks and work hours.
- Discipline on non-compliance with policy
- Adjust planned route to reflect actual route.

Ensure good Driver Fatigue Management

Case 5
Third party motor cyclist fatalities

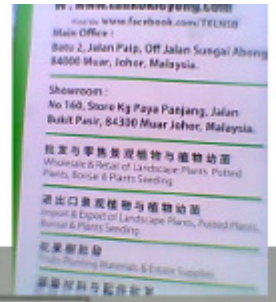
What Happened:

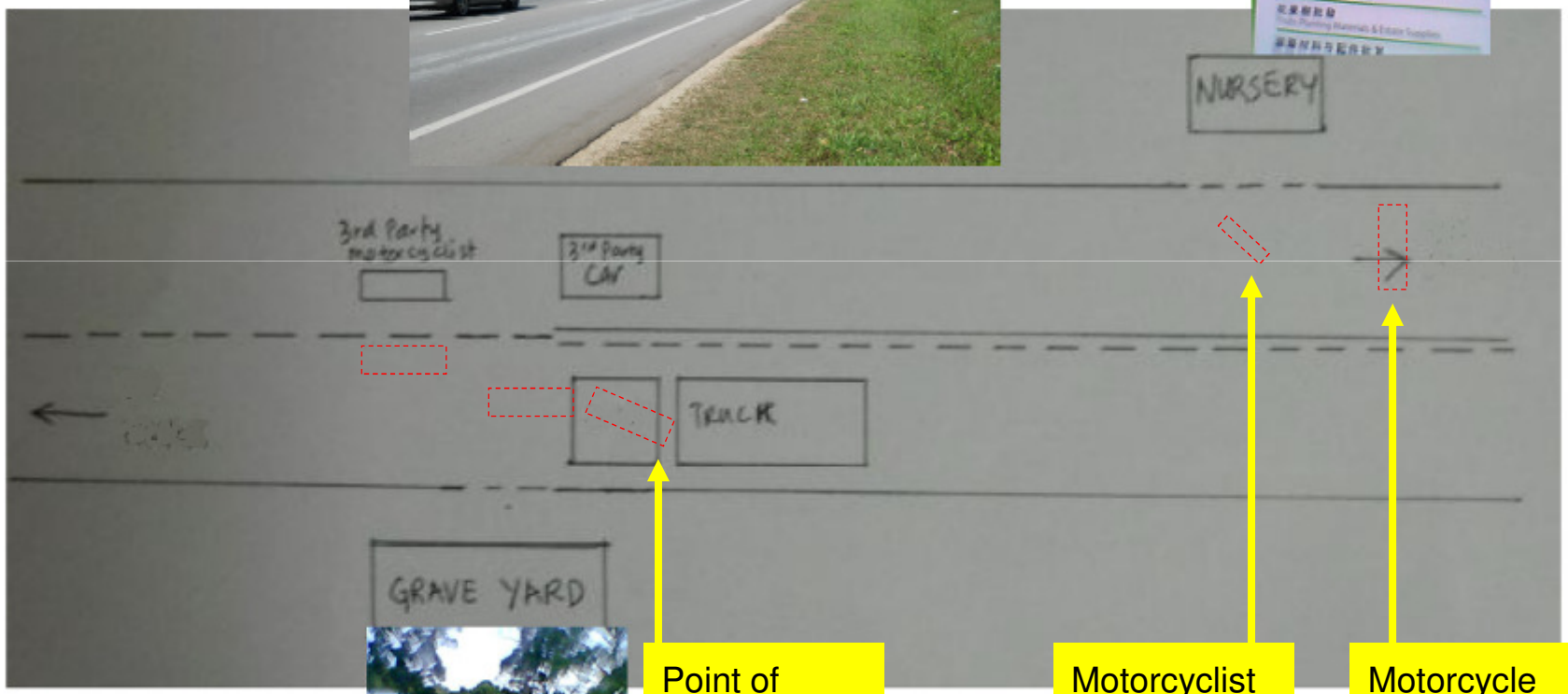
Incident 1:

- A fully loaded Liquid Nitrogen tanker had a side on collision with a motorcycle that was overtaking a passenger car from the opposite direction on a two way road. The motorcyclist fell and sustained fatal head injuries and passed away at the scene. The driver was wearing his seat belt and escaped without any injury. Motor cyclist was wearing crash helmet.

Incident 1 Pictures

Sketch of Accident Scene





Point of contact at the truck's lane

Motorcyclist landed here (45m from point of contact)

Motorcycle landed here (3m from the motorcyclist)

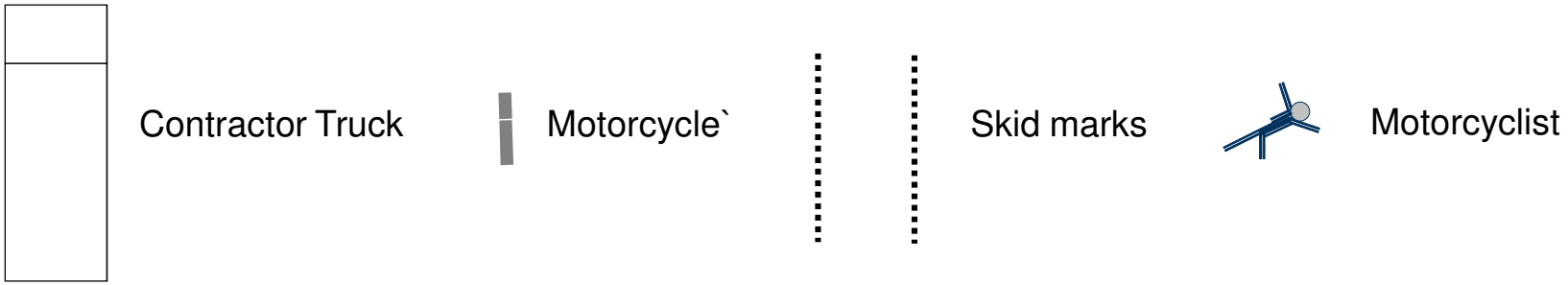
Incident 2:

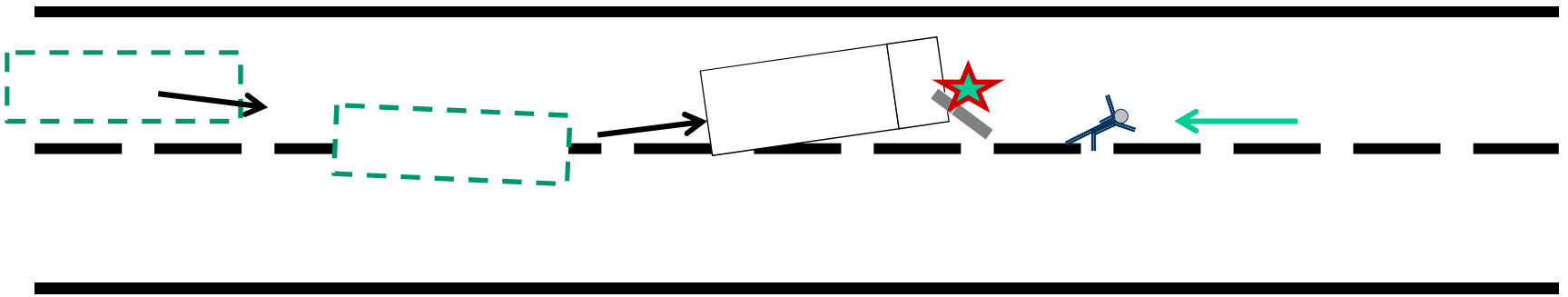
- A cylinder delivery vehicle travelling on two-lane road was involved in a head-on collision with a motorcyclist. Initial reports indicate that motorcyclist was travelling in the wrong lane, both vehicles took avoiding action which was unsuccessful and collided head-on. The motorcyclist was not wearing a crash helmet and was fatally injured.

Incident 2 Pictures

Incident 2 - Location Sketch (after impact) based on the skid marks on the road

Legend:





Cause(s) of incident

Common Cause (s)

- Driver error in Judging the situation
- Motorcyclist misjudged the speed of the passenger car he overtook and the speed of the oncoming truck
- Driver took evasive action by moving on to the opposite lane

Other Cause(s)

- Cyl Truck driver failed to apply Defensive Driving techniques by not looking ahead and anticipate oncoming vehicles and motorcyclist
- Cylinder truck was driving at a speed than the raod condition – poor lit roas
- Motorcyclist was under the influence of alcohol (Incident 2)

Key lessons and Preventive Measures

- To share with all drivers the importance of seeing & being seen by motorcyclist/road users and drive adjusting to the road condition and traffic
- Improve visibility of truck e.g. LED light on Cabin & body, reflective stickers.
- Re-emphasis on route risk analysis and communicate the risk of the routes to drivers and anticipating unsafe behavior of 3rd party road users
- Ensure driver drive at an appropriate speed based on stated limit and reviewing of trip information.

Make sure they (motorcyclists) see you !!

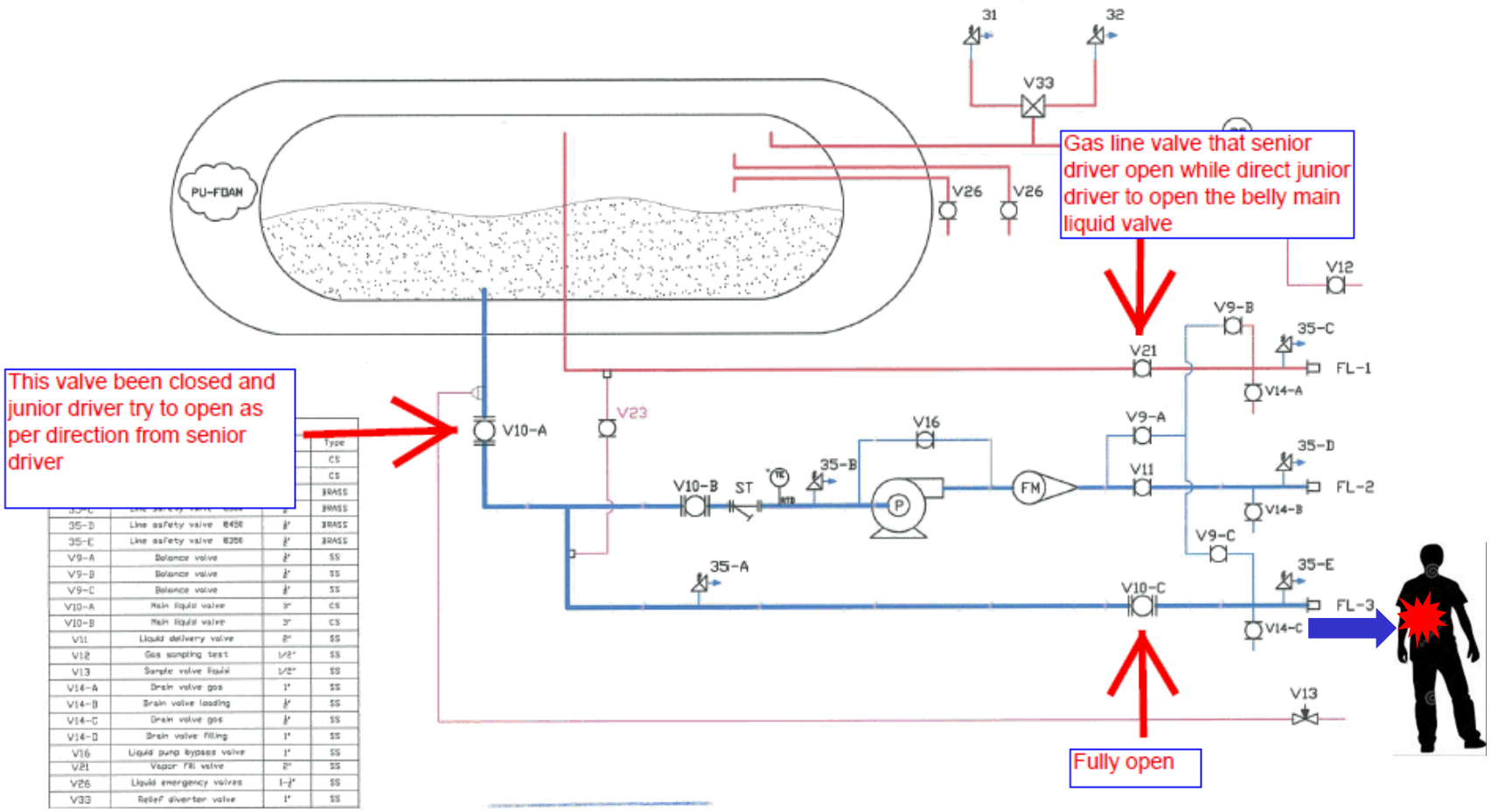
Section B:
Maintenance Incidents

Case 6
Lost Time Injury while doing trailer purging

What happened:

- While performing a trailer purge, an employee was hit by gas coming from the main supply valve and thrown away to the ground. Employee received 7 stitches and a "hair line" fracture at the base of the skull was identified.

Incident Pictures



			Type
			CS
			CS
			BRASS
			BRASS
35-D	Line safety valve 8456	¾"	BRASS
35-E	Line safety valve 8256	¾"	BRASS
V9-A	Balance valve	¾"	SS
V9-B	Balance valve	¾"	SS
V9-C	Balance valve	¾"	SS
V10-A	Main liquid valve	3"	CS
V10-B	Main liquid valve	3"	CS
V11	Liquid delivery valve	2"	SS
V12	Gas sampling test	1/2"	SS
V13	Sample valve liquid	1/2"	SS
V14-A	Drain valve gas	1"	SS
V14-B	Drain valve loading	¾"	SS
V14-C	Drain valve gas	¾"	SS
V14-D	Drain valve filling	1"	SS
V16	Liquid pump bypass valve	1"	SS
V21	Vapor fill valve	2"	SS
V26	Liquid emergency valves	1-½"	SS
V33	Relief diverter valve	1"	SS

Cause(s) of incident

- Less Than Adequate communication between the employees performing the trailer purge.
- Less Than Adequate hazard recognition.
- Employees performing a task for which they were not qualified.

Key lessons and Preventive Measures

- Employees were trying to help their colleagues in vehicle maintenance to speed up the maintenance process. They did not recognize the hazards associated with the activity.
- Reinforce with employees that they shall only perform tasks for which they are qualified and authorized.
- Review trailer purging procedure.
- Perform maintenance activities, including trailer purging, under a work permit.

Gap in Hazard Recognition and not following the SOP

Case 7
Lost Time Injury while doing equipment maintenance

What happened:

- While performing maintenance of an equipment, the employee used his finger to measure the clearance between the piston and metal plate. Another employee who was helping, pushed the metal plate and pinched first employee's finger. Injury required 3 stitches.

Cause(s) of incident

- Less Than Adequate communication between the two employees.
- Not followed the working procedure (appropriate tools to measure clearance were not used)
- During pre job discussion, supervisor assumed the employees will use the appropriate tools for the job. Clearance measurement procedure was not expressly discussed.

Key lessons and Preventive Measures

- Never assume !
- Reinforce the use of appropriate tools for the work.
- Enhance communication procedures, as well as supervision on hazardous work.
- Enhance pre job discussions.
- Review the procedure before the work is started

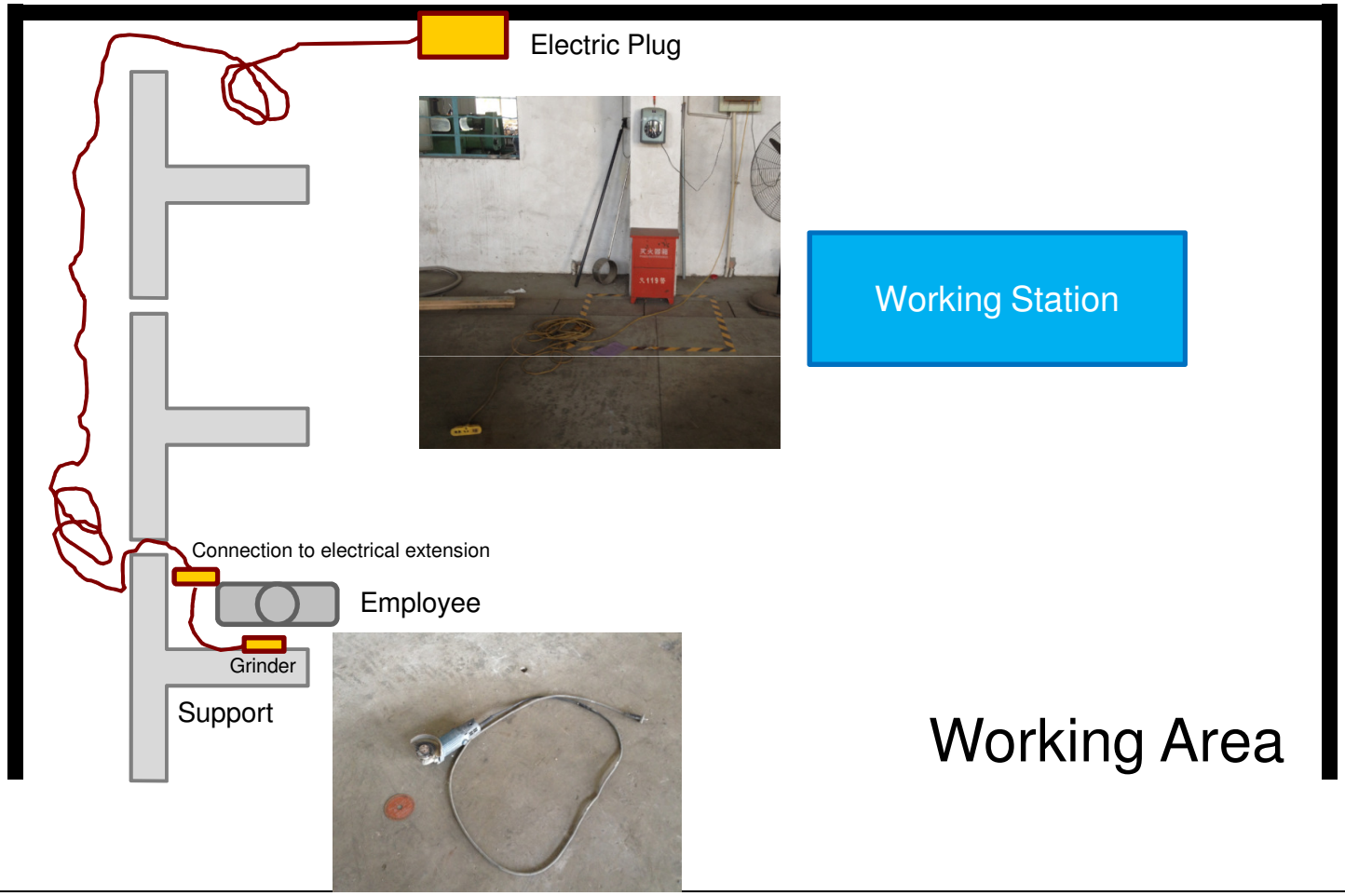
Gap in communication and not following the SOP

Case 8:
Contractor Lost Time Injury while using a hand tool

What happened:

- During the grinding process of a T-shape support for a piping distribution system, an employee pulled the electrical extension connected to the grinder to move to another point. The cable jammed with the support and the hand-grinder was disconnected. The employee left the grinder on the floor, and walked away to reconnect the grinder. Because the grinder was loose in the floor and the power was locked on, the grinder started to move on the floor. The employee disconnected again the grinder and walked with the extension cord at hand to the point in which the grinder was. While the employee was reconnecting the grinder, the grinding disk broke and a fragment hit in his head causing a wound of about 3 cm in right eyelid and forehead.

Incident Pictures



Cause(s) of incident

- Less Than Adequate working practices (Not using proper PPE, nor following procedures)
- Less Than Adequate supervision.
- Lack of Contractor Management

Key lessons and Preventive Measures

- Good supervision is essential.
- Clear rules and expectations shall be communicated to contractors, and then enforce them continuously.
- Use of contractor was banned.
- Reinforce of safe working procedures.

Gap in Contractor Management

Section C:
Incidents involving delivery of gas and liquid cylinders

Case 9:
Toppling of Liquid Cylinders During Delivery

What happened:

Incident 1:

- On a rainy day at a customer site, an escort fell down laying on the ground in pain as he jumped backwards to evade a falling 210kg O2 liquid cylinder that he was unloading on a uneven surface.

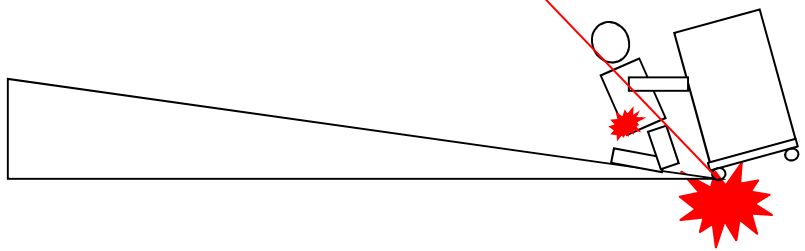
Incident 2:

- Wheels on the liquid cylinder cart stopped rolling due to change in surface condition and the liquid cylinder tips over.
- Person attempting to catch a falling liquid cylinder .

Incident Pictures – case 1

Incident Pictures – case 2

Gravity shift



Causes of incidents

- Hazard at the customer site - uneven flooring
- Inadequate safety review before performing a task
- Incorrect actions and decisions

Key lessons and Preventive Measures

- Never attempt to catch a falling liquid cylinders or a gas cylinder – serious injury can occur
- Conditions at customer sites may change – evaluate the hazards in advance and take appropriate action to perform the job safely
- The equipment used to transport the liquid cylinders must be appropriate for the conditions at the customer site
- If in doubt “stop the job” and get assistance
- Ref to AIGA TP 11/12

Gap in hazard identification at customer site

Case 10:
Cylinder Fall – High Severity Potential Event

What happened:

- Around 14:30, a loader was hit by two falling down cylinders at a customer site. The helper by mistake tilted the lift board instead of lowering straight. This caused the loader and the cylinders to topple and fall to the ground. Two cylinders hit the loader's left leg and caused the injury. His left tibia and fibula were broken

Incident Pictures

Cause(s) of the accident

- Helper's mistake
- Absence of fixture or arrangement to secure the cylinders on the tail board during lowering and unloading of cylinders

Key lessons and Preventive Measures

- Improve the design of the truck, viz the fall protection rail and early-warning for the tilting operation
- Use special truck where available.
- Ensure that cylinders are secured on the platform to prevent cylinders from falling
- Enhance job observation to timely eliminate unsafe behavior
- Enhanced communication

Gap in equipment design and operational discipline

Thank you

website: http://www.asiaiga.org