

CASE STUDIES

LOGISTICS AND TRANSPORT INDUSTRY



WSHCOUNCIL

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FALLS FROM HEIGHT

CASE 1

FALL FROM THE TOP OF A STACK OF STEEL PIPES

Description of Incident

A team of stevedores were unloading some steel pipes from the cargo hold of a vessel. Chain slings, with hooks at one end, were used to concurrently hoist a few steel pipes from the cargo hold. Prior to the hoisting of a bundle of steel pipes, one of the hooks dislodged from the end of a pipe in the bundle. One of the stevedores approached the hook, but he fell through a gap between the stacks of pipes and the bulkhead – a partition wall of the cargo hold – in the process. He landed at the bottom of the cargo hold and succumbed to his injuries four days later.

Findings

- Although work was supposed to start at about 1:00pm, the team of stevedores reported for work at about 7:00am. The stevedores stopped work at about 9:00pm and resumed at about 11:30pm. The accident occurred at about 12:30am.
- There was no risk assessment conducted before commencement of the work.
- No safe work procedures nor fall protection measures were in place.



1. The opening where the deceased fell through
2. Steel pipes



1. The ladder which was used to access the cargo hold
2. Steel pipes at the forward side
3. Steel pipes at the aft side

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Fall from height.
Immediate cause(s)	• Improper positioning of worker.
Basic cause(s)	• Unsafe work environment; fatigue.
Failure of SMS	• Hazard analysis and risk assessment.

Follow-up

The employer was instructed to conduct risk assessment for its activities.

The employer indicated that they would conduct more frequent toolbox meetings to brief workers on the work hazards, ensure sufficient lighting, ensure workers have enough rest and conduct risk assessment with the workers before commencement of work.

Identify appropriate fall prevention measures.

Recommendations

Apply proper rigging methods.

Conduct proper risk assessment prior to the commencement of any lifting operations.

Disseminate to workers, safety measures and safe work practices such as fall protection and the hazards of such lifting operations via toolbox meetings.

Closely monitor and review existing fatigue management programmes.

CASE 2

FALL FROM HEIGHT

Description of Incident

The incident occurred during the unloading of drums from a container placed on a trailer. A worker was using a drum mover – a material handler that resembles a push trolley with two wheels – to shift the drums to the edge of the container to facilitate the unloading of the drums from the container by a forklift. The work area inside the container was about 2m by 2m. When the worker was trying to shift a drum, he slipped and fell out of the container and landed on the ground about 1.45m below. He was sent to the hospital immediately and succumbed to his injuries eight days later.

Findings

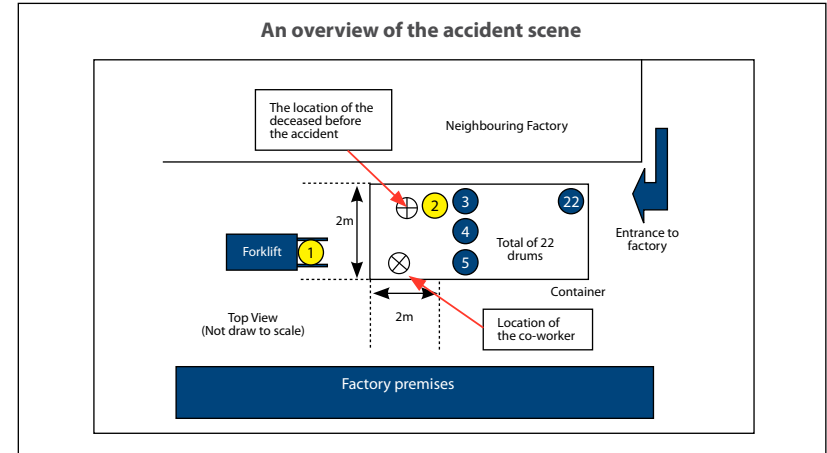
- The nose tips of the drum mover were probably not placed properly under the drum.
- When the worker tried to pull the handle towards himself to lift the drum, the nose tips slipped from underneath the drum, causing him to fall backward.



1. The drum mover which was used by the deceased



1. Normal usage of drum mover



Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Fall from height.
Immediate cause(s)	• Slipping while using drum mover.
Basic cause(s)	• Inappropriate handling of drum mover.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures.

Follow-up

The occupier was instructed to conduct risk assessment and implement safe work procedures for its activities, including loading and unloading work.

Recommendations

Conduct and regularly review risk assessment for loading and unloading of drums.

Observe safe work practices for manual material handling.

Disseminate information on hazards of such operations to workers.

CASE 3

FALL FROM SKYLOADER

Description of Incident

A worker fell from a skyloader and landed on the ground 3m below, when he was trying to open the inner door of the cargo hold of an aircraft. He was sent to the hospital and passed away on the same day. A skyloader is a vehicle mounted with a conveyor belt used in loading and unloading of cargo and baggage into and out of a cargo hold of an aircraft.

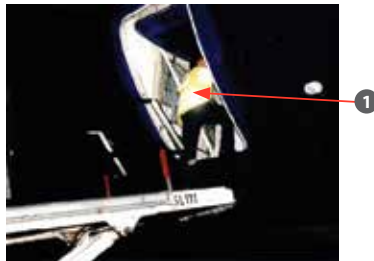
Findings

- At the time of the incident, the skyloader was operated by an Apron Officer, whose duty was to supervise the loading and unloading of cargo and baggage, but not the operating of the skyloader.
- The Apron Officer might have engaged the reverse gear accidentally, causing the skyloader to reverse and move away from the cargo hold when the worker was standing with one leg on the skyloader and the other on the entrance of the cargo hold, thus creating a gap through which the worker fell.
- There was no communication between the Apron Officer and the worker who was working at the top of the skyloader.

- The Apron Officer was not aware of the updates in the safety measures in relation to the operations of skyloaders, including the requirement for applying the handbrake and chocking the wheels before allowing personnel to climb up the skyloader.



1. The skyloader involved in the accident



1. A worker demonstrating where the deceased stood before he fell from the skyloader

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Fall from height.
Immediate cause(s)	• Unsafe operation of skyloader.
Basic cause(s)	• Failure to observe safety measures relating to skyloader operation; lack of communication between parties involved in skyloader operation.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Follow-up

The occupier was required to review its operational and communication systems to minimise risks involved in its activities.

Recommendations

Conduct proper risk assessment prior to the commencement of the operation.

Disseminate and enforce WSH rules and safe work procedures.

Ensure that only qualified and authorised personnel are allowed to handle machines/equipments.



CAUGHT IN BETWEEN OBJECTS

CASE 4

CAUGHT BETWEEN THE MAST SECTION AND CABIN OF FORKLIFT

Description of Incident

A service technician was assigned to repair a forklift on the owner's premises. He was required to replace the seals for the hydraulic cylinders of the mast section of the forklift to prevent oil leakage. About an hour into the repair work, he was found trapped, with his neck caught between the mast section and the roof of the operator's cabin. He died of brain damage due to suffocation. The battery cable was connected and the engine was running when the worker was found trapped in the forklift.



1. Mast section of the forklift truck
2. The deceased was trapped between the mast section and the operator cabin roof
3. Operator cabin

Findings

- The worker's right leg was next to the control lever which controlled the tilting movement of the mast section.
- When the worker was working on the mast section, his right leg might have accidentally come into contact with the control lever, causing the mast section to tilt towards the operator's cabin, pressing his neck against the roof of the cabin.

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Caught in between objects.
Immediate cause(s)	• Servicing equipment without disconnecting the power supply.
Basic cause(s)	• Failure to implement and comply with repair procedures.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Follow-up

The supplier of the forklift was instructed to improve on the mechanism of the supporting props for the inner mast section to enhance workers' safety.

The supplier had reminded their staff to disconnect the power supply to the forklift when it was not required during repair work.

Recommendations

Develop and implement lockout procedures relating to the inspection, cleaning, repair or maintenance of any plant, machinery, equipment or electrical installation in the factory that, if accidentally activated or energised, is liable to cause bodily injury to any person.

Conduct proper risk assessment prior to the commencement of an operation.

Employers should ensure that their workers have received proper training on safe work procedures relevant to the tasks performed.

Conduct regular checks and supervision to ensure that workers comply with safe work procedures.

CASE 5

CRUSHED IN BETWEEN METAL RACKS

Description of Incident

A tally clerk was checking a consignment of cargo in carton boxes, placed on a row of metal racks. While he was working between the metal racks, a forklift pushed the row of metal racks together, to close the gap between the racks to free up space for more cargo. The tally clerk was trapped in between the metal racks and crushed to death.



1. Forklift's position prior to pushing the metal racks
2. Deceased was caught in between the metal racks

Findings

- The labels of some of the carton boxes were not visible from the side of the metal racks, making it necessary for the tally clerk to go between the rows of racks.
- No communication nor work coordination between the tally clerk and the forklift operator.
- Cartons on the racks blocked the sight of the forklift operator.
- No checks to ensure that there was nobody between the racks before they were pushed to close the gap.



1. Deceased was caught in between the metal racks
2. Labels on carton boxes

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Caught in between objects.
Immediate cause(s)	• Unsafe pushing of metal racks by the forklift; lack of communication between parties working at the same premises.
Basic cause(s)	• Failure to implement safety control measures to eliminate the risk of workers being trapped between the metal racks during the forklift operation.
Failure of SMS	• Hazard analysis and risk assessment; safe work procedures; and WSH training and competency.

Follow-up

The occupier was instructed to conduct risk assessment of the work activities carried out on the premises.

The occupier implemented measures to manage the movement of forklifts and workers; provided a designated work area for tally clerks to check the cargo; and required their workers to use reflective vests and safety boots.

Recommendations

Conduct proper risk assessment prior to the commencement of such operations.

Develop safety measures or safe work procedures to ensure the safety of tally clerk.

Ensure adequate communication between parties working at the same premises.

Conduct trainings and briefings to improve WSH competency and awareness.

CASE 6

CRUSHED BETWEEN PRIME MOVER AND CONTAINER

Description of Incident

A prime mover driver was assigned to tow a trailer, loaded with a 40-foot container E, parked at the designated holding area of a factory. During the coupling process, the prime mover, with the trailer already attached, rolled across the road and crashed through the perimeter fence before coming to a stop. The prime mover driver's body was later found lying on the ground beside container B, along the path where the prime mover had rolled over earlier.

- After coupling the prime mover with the trailer, the driver was connecting the air hoses of the trailer brake system when the trailer and the prime mover started to roll down the slope.
- Graze marks found on container B and the prime mover revealed that the driver might have attempted to board the runaway prime mover to pull the handbrake. But before he could enter the driver's cabin, he was crushed between the moving prime mover and the stationary container B.

Findings

- The holding area was inclined at a slope of about 2.5 degrees.
- The engine of the prime mover was on; the transmission gear was in "neutral" position; the handbrake was in "release" position.

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Caught in between objects.
Immediate cause(s)	• Failure to engage the handbrake of the prime mover.
Basic cause(s)	• Unsafe act of trying to board the moving prime mover.
Failure of SMS	• WSH practices.

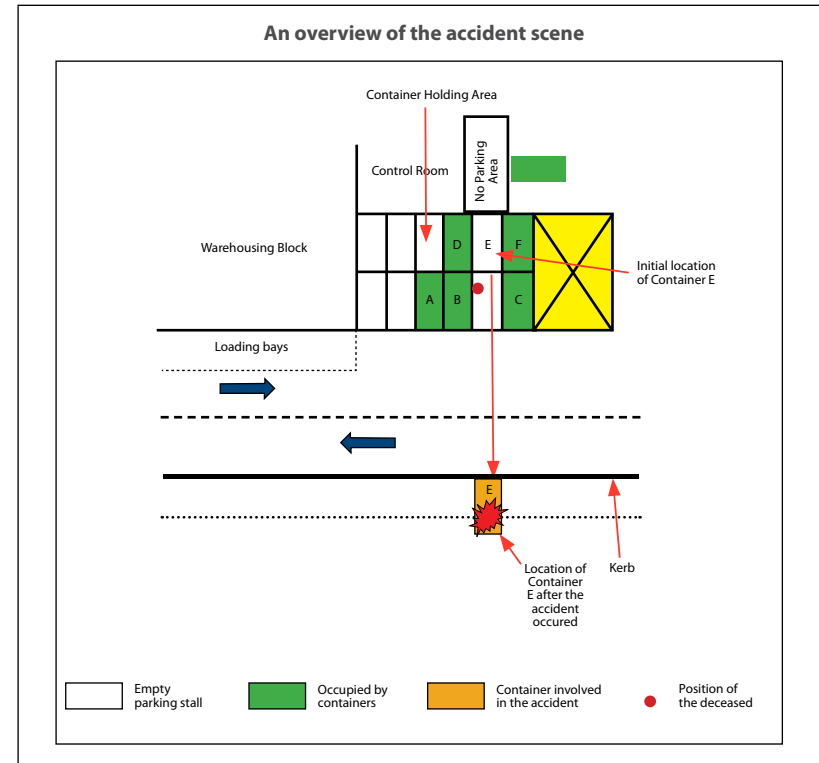
Recommendations

Observe safe work practices and engage the handbrake when parking vehicle.

Safety measures such as the "wheel choke" should be used to prevent the parked vehicle from moving.

Conduct in-house refresher training to update and remind prime mover drivers of WSH knowledge and safe work procedures.

Drivers should be instructed to stay clear of any runaway vehicle and not attempt to chase after or board it.



CASE 7

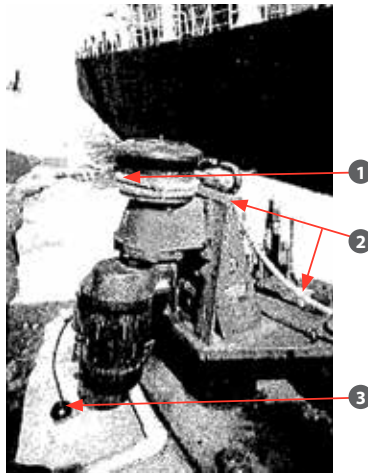
HAND CRUSHED BY WINDING ROPE

Description of Incident

A group of 10 workers and two boats were deployed to moor a ship at a jetty. Three workers were assigned to moor the head line of the ship. The mooring process involved the use of capstans situated on the jetty to wind in the mooring ropes from the ship. The capstans were driven by electric motors which were operated by foot switches. Messenger ropes were tied to the headline, and one of the workers mooring the head line activated the foot pedal switch of the capstan to wind in the messenger rope. After two rounds of winding, the head line was stuck at the dolphin. The worker decided to wind in the rope for another round before releasing the foot pedal switch to stop the capstan. However, when he released his foot, the switch was stuck in its "ON" position. The motor did not stop and continued to wind in the rope. The worker attempted to stop the capstan from winding by giving the pedal a few hard steps to free the switch. One of his co-workers came to assist him by giving the foot pedal switch a few hard knocks to stop the capstan. The co-worker successfully freed the switch but the worker's left hand, which was guiding the rope, was crushed between the winding rope and the capstan. Part of the worker's left index finger and the tip of the left middle finger were amputated.

Findings

- The fault in the equipment was not detected during pre-operation checks and tests.
- The worker did not release his hand in time.
- There was no emergency "stop" button for the capstan.



1. The left hand of the injured was caught by the messenger rope winding onto the capstan
2. Two workers were here to guide the messenger rope
3. The foot pedal switch was jammed at the time of the accident

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Caught in between objects.
Immediate cause(s)	• Defective tool or equipment.
Basic cause(s)	• Inadequate maintenance; absence of emergency stop control.
Failure of SMS	• Maintenance regime; WSH practices and procedures.

Recommendations

Implement an appropriate equipment maintenance programme taking into consideration the working environment for the capstan motor.

The capstans should be provided with an electrical isolator or emergency stop button for cutting off the electrical source during an emergency.

CASE 8

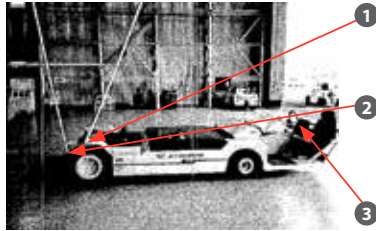
FINGER SEVERED BY SWIFTLY CURLING TOW LINE

Description of Incident

The tractor involved in the incident was installed with a wired remote control for winding and unwinding of its tow line. When the tractor was towing its load, the remote control fell off and was run over by one of the wheels. The tractor driver picked up the remote control and continued with the trip. When he had finished the work, he tried to check and test the remote control. The initial tests showed that the remote control was working intermittently. Then he called upon a colleague to help him with further tests. The tractor driver asked the colleague to turn on the electricity supply at the driver's seat. Expecting the tow line to uncoil, he held the hook of the tow line with his right hand to prevent the tow line from entangling. At first the tow line did not move but it started curling in swiftly suddenly. The hand of the driver was caught and part of his right middle finger was severed in the incident.

Findings

- Failure to assess the risk of testing and operating the faulty remote control.
- Failure to adopt an appropriate method of holding the hook of the tow line to prevent entangling.



1. The tow line
2. The wired remote control of the tow line
3. The main control of the tow line was located at the front of the driver seat



1. The strap started to be coiled in shortly after the electrical supply to the tractor was being turned on
2. The tow hook of the tow line
3. The finger of the injured was caught in between the safety catch and the throat of the hook

Causal Analysis

Evaluation of loss	• One worker killed.
Type of contact	• Caught in between objects.
Immediate cause(s)	• Use of faulty equipment, adopting unsafe work method.
Basic cause(s)	• Inadequate supervision; failure to comply with work procedure.
Failure of SMS	• WSH practices and procedures; WSH training and competency.

Recommendations

- Implement and put in place proper repair and testing procedures.
- Faulty equipment should be serviced by competent personnel.



STRUCK BY MACHINES

CASE 9

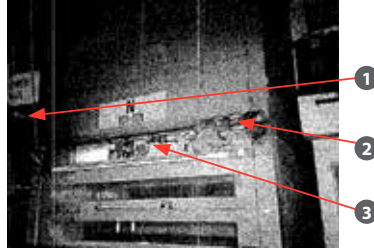
FINGER SEVERED BY CLOSING PANEL COVER

Description of Incident

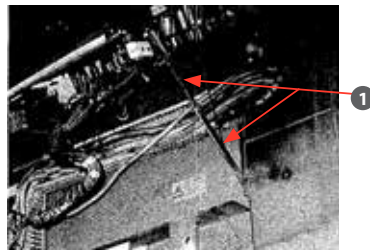
A technician was opening the panel cover of a switchboard to inspect the circuit breakers. He had to lock the supporting arms of the panel cover to fully open the cover and hold it in position so that his hands would be free to perform the checks. He used his left hand to lock the left foldable supporting arms of the panel cover while his right hand was holding the panel cover. When he tried to lock the supporting arms on the right, the cover slipped off his right hand and crashed down to close instantly, folding up the supporting arms. His left ring finger was caught between the supporting arms and part of it was severed.

Findings

- Failure to follow procedures to have one more team member to handle long and bulky objects.



1. One of the two foldable metal supporting arms
2. The metal supporting arm that the injured was locking
3. The circuit breakers that the injured had reset



1. The two folding parts of the metal supporting arm

Causal Analysis

Evaluation of loss	• One worker injured – severed finger.
Type of contact	• Struck by machines.
Immediate cause(s)	• Mishandling of panel cover; inadequate manpower assigned for the task.
Basic cause(s)	• Improper work procedures; inadequate supervision.
Failure of SMS	• WSH practices and procedures.

Follow-up

The occupier had replaced the foldable supporting arms with lockable gas springs that would automatically push up the cover and keep it in position once opened.

Recommendations

Redesign the panel cover so that a technician attending to the switchboard could open the cover without assistance.

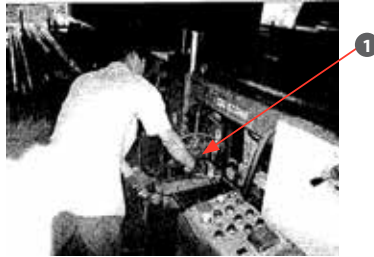
Conduct refresher training to remind workers of WSH issues and to raise WSH awareness.

CASE 10

FINGERS AMPUTATED BY BANDSAW

Description of Incident

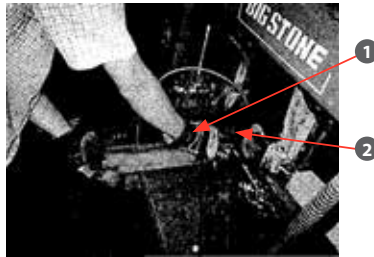
A worker was using a bandsaw to cut a steel rod into the specified lengths. When he was removing the first piece of the cut product, the glove on his right hand was caught by the moving bandsaw and his right ring and little fingers were amputated.



1. Unsafe lifting method adopted by the injured prior to the accident

Findings

- Not sufficient guarding of the machine, allowing hands or other parts of a person's body to come into contact with the saw blade.
- Inappropriate timing and method of removing the cut product – worker used his right hand to grip the tail end of the cut product when the tail end was still close to the moving bandsaw blade.
- The worker was not aware of the proper procedures and relevant safety precautions.



1. Cut-resistant glove
2. Bandsaw blade

Causal Analysis

Evaluation of loss	• One worker injured – amputated fingers.
Type of contact	• Cut by moving objects.
Immediate cause(s)	• Inadequate guarding; unsafe act of removing finished product.
Basic cause(s)	• Failure to observe safe practices.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Recommendations

- Conduct proper risk assessment prior to the commencement of the job and update on new risks/hazards encountered.
- Put in place safety measures or adequate guarding systems to prevent contact with the saw blade and other sharp moving parts of machinery.
- Conduct in-house safety training for workers to ensure workers' WSH awareness and competency.



STRUCK BY FALLING OBJECTS

CASE 11

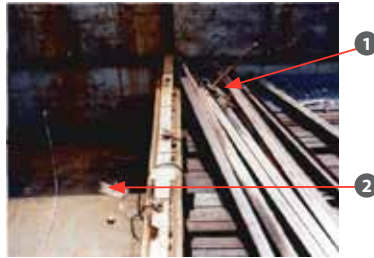
STRUCK BY FALLING METAL BEAMS

Description of Incident

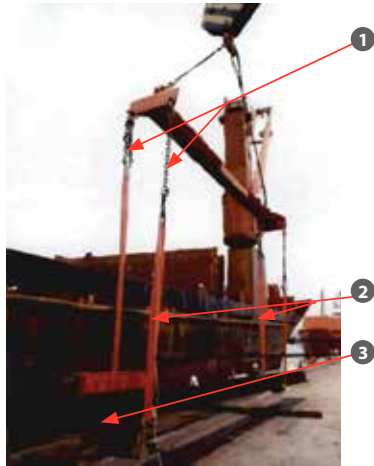
A team of stevedores were deployed to load some metal beams onto a vessel. About 30 minutes after the commencement of the loading work, the webbing slings on one end of the spreader bar snapped while a bundle of metal beams was lifted over the cargo hold. As a result, the metal beams slipped out of the sling and dropped from a height of about 6m onto the cargo hold. One of the workers inside was hit and his legs were pinned under the metal beams. He was rescued from the pile of metal beams and sent to hospital. He succumbed to his injuries and died on the same day. The other worker fell from a height of 3m to the bottom of the cargo hold while evading the falling metal beams and sustained multiple injuries.

Findings

- Poor storage and maintenance might have contributed to the damaging of the webbing slings.
- Absence of padding to prevent effects of point loading and failure of the slings due to localised cutting by the edges of the beams.
- There was no check on the lifting gears prior to work commencement.



1. The deceased worker was found to be pinned at this location
2. The injured worker was found at the bottom of the cargo hold



1. Chain slings with hook
2. Webbing slings
3. Metal beams

Causal Analysis

Evaluation of loss	• One worker killed and one injured.
Type of contact	• Struck by falling metal beams and falling into lower level of cargo hold.
Immediate cause(s)	• Inadequate protective equipment such as padding for lifting.
Basic cause(s)	• Poor work planning; inadequate assessment of risk.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; control of subcontractors activities; WSH maintenance regime.

Follow-up

The occupier was instructed to review the risk assessment and control measures relating to stevedoring activities within the premises.

The occupier will implement stricter safety enforcement, monitor the safety performance of their contractors and require safety training of workers.

The shipping agent was instructed to conduct risk assessment for the lifting operation.

Recommendations

Proper rigging method should be applied.

Conduct proper risk assessment prior to the commencement of the lifting operation.

Conduct inspection of lifting gear before use.

Implement a maintenance regime for lifting equipment and lifting gear.

Implement and enforce regular supervision and control of subcontractor's activities.



STRUCK BY MOVING VEHICLES

CASE 12

PINNED TO GROUND BY TOPPLING FORKLIFT

Description of Incident

A worker was operating a forklift in the process of loading and unloading bags of sugar in a warehouse. The accident occurred when he had unloaded a bag of sugar and was on his way to pick up another. The forklift toppled when it was making a turn and the worker was pinned under the forklift. He was rushed to the hospital where he passed away shortly after.

Findings

- At the time of accident, the fork of the forklift was at the top position.
- It was probable that the forklift operator was making a sharp turn.
- The deceased worker had completed the necessary forklift operations training at the time of accident.

Causal Analysis

Evaluation of loss	<ul style="list-style-type: none">• One worker killed.
Type of contact	<ul style="list-style-type: none">• Struck by toppling forklift.
Immediate cause(s)	<ul style="list-style-type: none">• Improper placement of fork; improper movement of forklift; failure to wear seatbelt.
Basic cause(s)	<ul style="list-style-type: none">• Failure to observe safe forklift practices.
Failure of SMS	<ul style="list-style-type: none">• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency; WSH safety inspections.

Recommendations

Enforce or conduct regular safety inspection to ensure safe forklift operation.

As a good practice, seatbelts should be put on during forklift operation and the fork should not be in the top position when the forklift is moving.

Conduct proper risk assessment prior to the commencement of forklift operations.

Conduct refresher safety training of safe forklift operation.

Highlight hazards of forklift operation during toolbox meetings.

Note

The deceased had completed the necessary training for forklift operations 15 years ago and there is no requirement under the law for him to attend mandatory training again. This case clearly addresses the need for the implementation of an in-house refresher course, as a good practice to keep forklift operators up-to-date on safe work procedures and practices.

CASE 13

STRUCK BY SIDE LOADER

Description of Incident

A few side loaders were used within a container depot to load and unload containers between prime movers and stacks of containers. When one of the side loaders was making a right turn to approach a 40-foot container, it ran over a worker. The worker died on the spot.

The accident could have occurred when the worker emerged from a gap between two containers and the side loader driver could not stop his side loader in time. At the time of the accident, the worker was not wearing his high visibility vest.

Findings

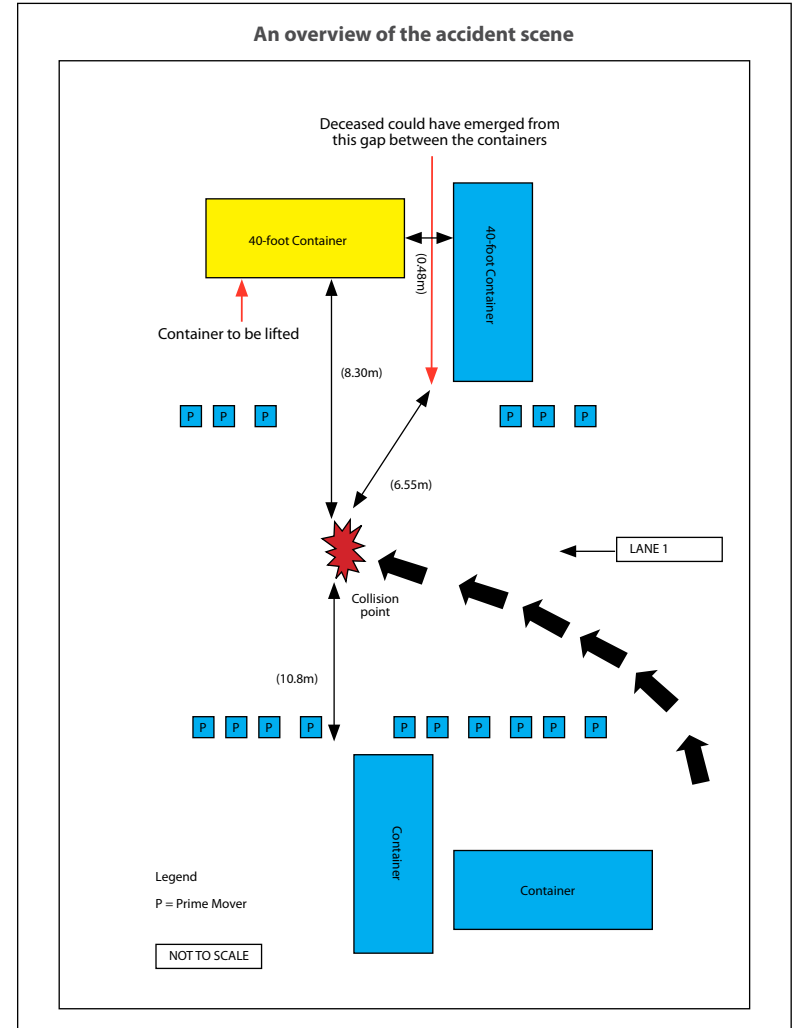
- Poor layout design of the container depot; no properly demarcated driveways, storage area and pedestrian passageways within the depot.
- Traffic management system not in place to control movement of vehicles and people within the container depot.



1. Spreader
2. Operator's cabin
3. Mast



1. Deceased could have emerged from this gap between the containers
2. Driveway and container storage areas not demarcated



Causal Analysis

Evaluation of loss	<ul style="list-style-type: none">• One worker killed.
Type of contact	<ul style="list-style-type: none">• Struck by moving vehicle.
Immediate cause(s)	<ul style="list-style-type: none">• Unsafe driving of side loader; high visibility vest not used; no proper demarcation of storage area, passage way and driveway
Basic cause(s)	<ul style="list-style-type: none">• Lack of traffic control management programme.
Failure of SMS	<ul style="list-style-type: none">• Hazard analysis and risk assessment; WSH practices and procedures.

Follow-up

A Stop Work Order was issued, instructing the occupier to redesign the layout to minimise human traffic in the depot.

The occupier was advised to deploy more traffic controllers and container checkers to manage vehicle movement within the depot.

The occupier demarcated special pedestrian crossings along the lanes and required the container checkers and prime mover drivers to wear high visibility vests and adhere to rules and regulations to ensure their own safety.

Recommendations

Conduct regular refresher safety training of side loaders.

Clearly demarcate pedestrian passageways and driveways to separate human and vehicle traffic.

Designate pedestrian crossings at appropriate locations.

Conduct regular safety inspections and enforcement to ensure workers comply with safe work procedures and safety rules such as using the designated pedestrian walkways and wearing high visibility vests.

CASE 14

THROWN OUT OF VEHICLE UPON COLLISION

Description of Incident

A prime mover, coupled with a container trailer, was moving along a road with two-way traffic when it swerved and hit the rear of another prime mover travelling in the opposite direction. The driver of the first prime mover was thrown out of the driver's cabin and landed on the ground. He was sent to the hospital where he succumbed to his injuries a few hours later.

Findings

- There were no tyre skid marks on the road around the vicinity of collision, indicating there was no emergency braking.
- Prior to the accident, the deceased worker had been working for about 10 hours, on top of working 12-hour night shifts consecutively for four days before the accident.
- The seat belt used by the worker was found to be extended and choked with paper, rendering it ineffective.

Causal Analysis

Evaluation of loss	<ul style="list-style-type: none">• One worker killed.
Type of contact	<ul style="list-style-type: none">• Fall to the ground upon collision of vehicles.
Immediate cause(s)	<ul style="list-style-type: none">• Unsafe driving of vehicle; improper use of seat belt.
Basic cause(s)	<ul style="list-style-type: none">• Fatigue; failure to observe safe practices such as use of seat belt.
Failure of SMS	<ul style="list-style-type: none">• Hazard analysis and risk assessment; WSH practices and procedures.

Follow-up

Safety alert issued to drivers to remind the need to use seat belts while driving.

Recommendations

Conduct fatigue management and monitoring of working hours to ensure that workers have proper rest and are fit for work.

Educate and promote safe driving to inculcate safety culture.

Enforcement by employers on the use of seat belts.

CASE 15

HIT BY SIDE LOADER

Description of Incident

After unloading a container, a side loader operator turned around and moved forward in the reverse direction. As the sideloader was moving along, it hit and ran over a worker who had emerged from between the gap of two rows of containers. The worker died on the spot.

Findings

- The side loader operator claimed that he was monitoring the spreader arm of the side loader so as to avoid hitting the containers on his left; thus he was not able to adequately monitor the traffic in front of the side loader and failed to spot the worker who had just emerged from between the containers.
- The mast of the side loader might have obstructed the front view of the side loader operator.
- There was no designated walking path for workers inside the container storage yard. Workers and side loaders were allowed to roam freely.



The side loader reversed from this row of containers just before the accident



1. The side loader

Causal Analysis

Evaluation of loss	<ul style="list-style-type: none">• One worker killed.
Type of contact	<ul style="list-style-type: none">• Struck by moving vehicle.
Immediate cause(s)	<ul style="list-style-type: none">• Unsafe driving of vehicle; no proper access route provided.
Basic cause(s)	<ul style="list-style-type: none">• Lack of traffic control measures.
Failure of SMS	<ul style="list-style-type: none">• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Follow-up

Redesign the layout of the premises to minimise the need for workers to move around on the premises and to accommodate designated pedestrian walkways.

Implement traffic control measures to separate the paths of pedestrians and vehicles.

Develop and implement safe work procedures.

Recommendations

Proper layout design to minimise traffic hazards.

Proper access route for workers.

Develop and implement a workplace traffic management programme to separate the paths of pedestrians and vehicles.

Conduct regular safety inspections and enforcement to ensure workers comply with safe work procedures and safety rules such as using the designated pedestrian walkways and wearing luminous vests.



ELECTROCUTION

CASE 16

ELECTROCUTION

Description of Incident

Six workers were deployed for the repainting of a ship. After completing part of the work, the workers relocated the painting materials and electrical lighting to set up on another part of the ship. During the course of the relocation, one of the workers slipped and fell on the main deck of the ship and got his clothing soaked with water as the main deck was wet. About 2 hours after the relocation and resumption of painting works, the above worker was called upon by a co-worker to help secure a work platform. While the worker was walking towards the co-worker, he fell and created a sound that alerted the co-worker. The co-worker found the worker lying motionless on the deck near a metal ladder.

Findings

- The electrical cables supplying electricity for lighting were lying on the wet deck.
- Two out of five light bulbs fixed onto the cargo lamp used for lighting were not of the correct type and part of the metal base of the bulbs were exposed.
- The workers were not supplied with safety shoes.
- A burnt mark on the deceased worker's right thumb suggested that he might have held on to the metal ladder while other part of his

body was in contact with an exposed electrical source.

- The electrical system was not earthed as the vessel was berthed alongside the terminal; the electrical equipment was also not inspected before use.



1. Single bulb lamp was hung here during accident
2. 3-way socket outlet
3. Cargo lamp was moved here after accident



1. Cargo lamp was hung here during accident
2. Socket cables connected to single bulb lamp
3. Metal housing for permanent electrical installation

Causal Analysis

Evaluation of loss	• Evaluation of loss: One worker killed.
Type of contact	• Electrocution.
Immediate cause(s)	• Contact with exposed live part of electrical equipment, failure to elevate the electrical cable from wet ground.
Basic cause(s)	• Failure to inspect electrical equipment before use; failure to observe safe work procedures.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Follow-up

- The occupier would require their contractors to conduct a risk assessment before the commencement of work.
- The employer would implement preventive safety measures including risk assessment, inspection of electrical equipment and conduct safety briefings with the workers.

Recommendations

- Conduct proper risk assessment prior to the commencement of the job.
- Conduct inspection of electrical equipment regularly and before use.
- Conduct safety briefing or toolbox meeting for workers to ensure they are aware of the hazards in their work.
- Conduct regular maintenance to ensure that electrical equipment is in good operational condition.



**WORK-RELATED
TRAFFIC ACCIDENTS**

CASE 17

COLLISION BETWEEN MOTOR BUS AND MOTORCYCLE

Description of Incident

A motor bus sending workers to their company was moving along a two-way traffic road. When approaching a traffic light junction indicating red light, the motor bus failed to stop and collided into a motorcycle that was stopping at the same traffic light junction. After the collision, the motor bus continued in its path forward, colliding with three other vehicles that were turning right from the opposite direction. The motorcyclist succumbed to his injuries subsequently.



1. Position of motor bus at traffic junction after collision.
2. Deceased succumbed to his injuries at this location

Findings

- Mechanical inspection of the motor bus found the hydraulic brake master pump reservoir to be empty, suggesting the possibility of a leak. It was also found that no brake fluid warning indicator was installed on the bus.

Causal Analysis

Evaluation of loss	• One motorcyclist killed.
Type of contact	• Front-to-rear vehicle collision.
Immediate cause(s)	• Failure to apply brake at traffic light junction.
Basic cause(s)	• Hydraulic brake master pump reservoir of the motor bus was empty.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Recommendations

Conduct vehicle inspection periodically.
Perform vehicle check before every road assignment to ensure that the vehicle is safe for use.
Install warning indicators to alert driver of vehicle's malfunctions.

CASE 18

COLLISION BETWEEN PRIME MOVER AND MOTORCYCLE

Description of Incident

A prime mover was waiting to make a right turn at a traffic junction. Unaware to the driver, a motorcycle had come alongside on the left of the prime mover and stopped in front of it. As the prime mover moved forward and made its turn, it hit the motorcycle, throwing the motorcyclist and his pillion passenger off their seats. The motorcyclist was then run over and killed by the prime mover's wheel, while the passenger escaped with some abrasion injuries.



1. Deceased's motorcycle pinned under the prime mover.

Findings

- At the passenger side of the prime mover, the windscreen was pasted with road tax discs and the dashboard was piled with documents. These items obstructed the driver's sight, denying him a clear view of what was in front of the prime mover. The driver's view was further hampered by his physical height which was below 1.6 metres.

Causal Analysis

Evaluation of loss	• One motorcyclist killed.
Type of contact	• Front-to-rear vehicle collision.
Immediate cause(s)	• Failure to notice motorcycle.
Basic cause(s)	• Driver's view was obstructed by documents placed on the dashboard and road tax discs pasted on the windscreen.
Failure of SMS	• Hazard analysis and risk assessment; WSH practices and procedures; WSH training and competency.

Recommendations

Ensure that the driver has a clear view of his surroundings from the cabin.
Adjust the rear and wing mirrors for better visibility of the vehicle's surrounding.
Install in-vehicle camera units to minimise the number of blind spots.

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