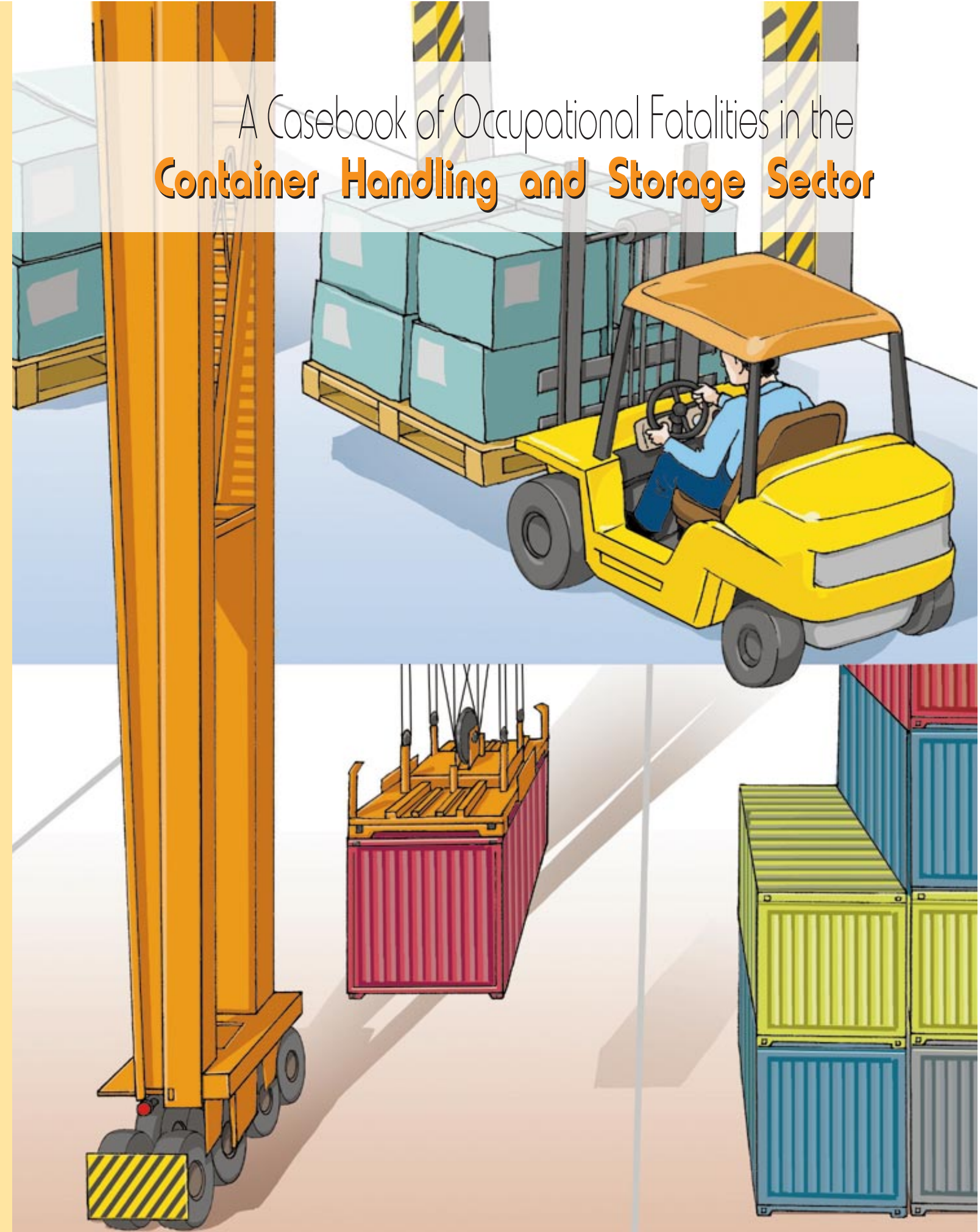


A Casebook of Occupational Fatalities in the Container Handling and Storage Sector



This booklet is prepared by the
Occupational Safety and Health Branch,
Labour Department

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A Casebook of Occupational Fatalities in the Container Handling and Storage Sector

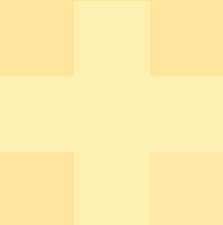
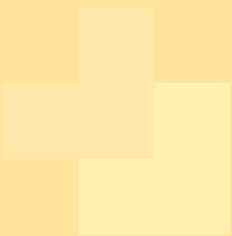
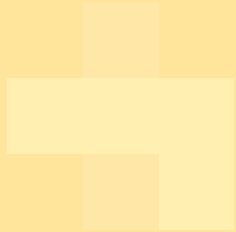
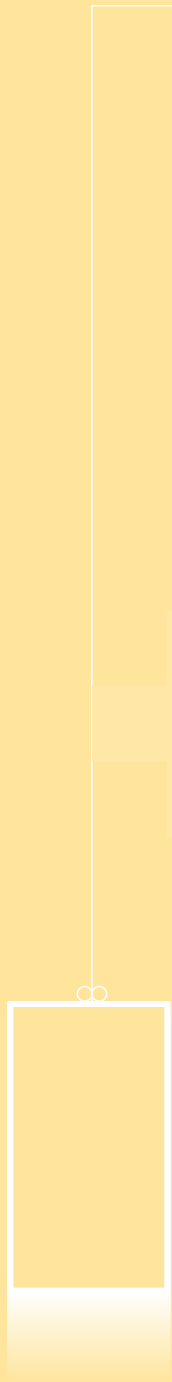


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FOREWORD

Workplace accidents not only cause sufferings to the victims and their families, but also incur costs arising from work stoppages, insurance claims, medical and rehabilitation expenses, etc.

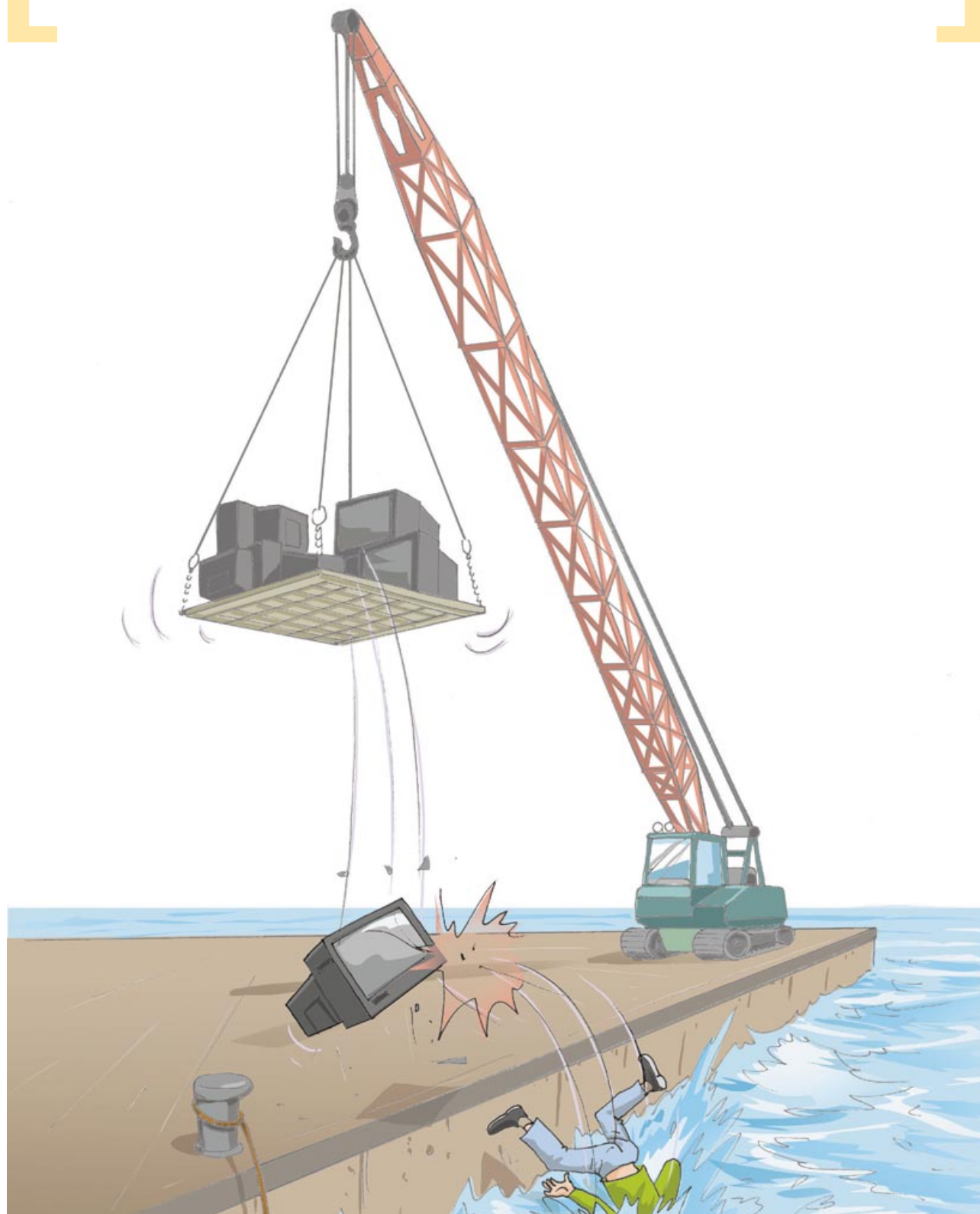
Most workplace accidents are preventable. Very often, they share common scenarios and causes. Unless such scenarios and causes are properly understood, lessons cannot be learned and suitable measures will not be implemented to prevent recurrence of such accidents.

This casebook features a number of fatal accidents that occurred in the container handling and storage sector. It can be used for experience sharing on accident causes and prevention and as case studies for safety training institutes. It also aims to provide lessons to those who are involved in such work activities and their managers.

Occupational Safety and Health Branch
Labour Department
 June 2006

Case 1

The captain of a cargo vessel drowned as a result of a loose load falling from the receptacle suspended by a mobile crane.



Scenario

The deceased person and his team of workers were engaged in transferring used electrical appliances that were stored in a container on the shore to a river trade cargo vessel berthed alongside a cargo handling area. The electrical appliances were removed from the container and stacked onto a receptacle by the deceased person and his team of workers. The receptacle containing the electrical appliances was then transferred to the cargo vessel by means of a mobile crane. In one lifting operation, an electrical appliance in the receptacle fell and landed in the close vicinity of the deceased person. As the deceased person was standing close to the edge of the berth, he fell into the sea and eventually drowned.

Case analysis

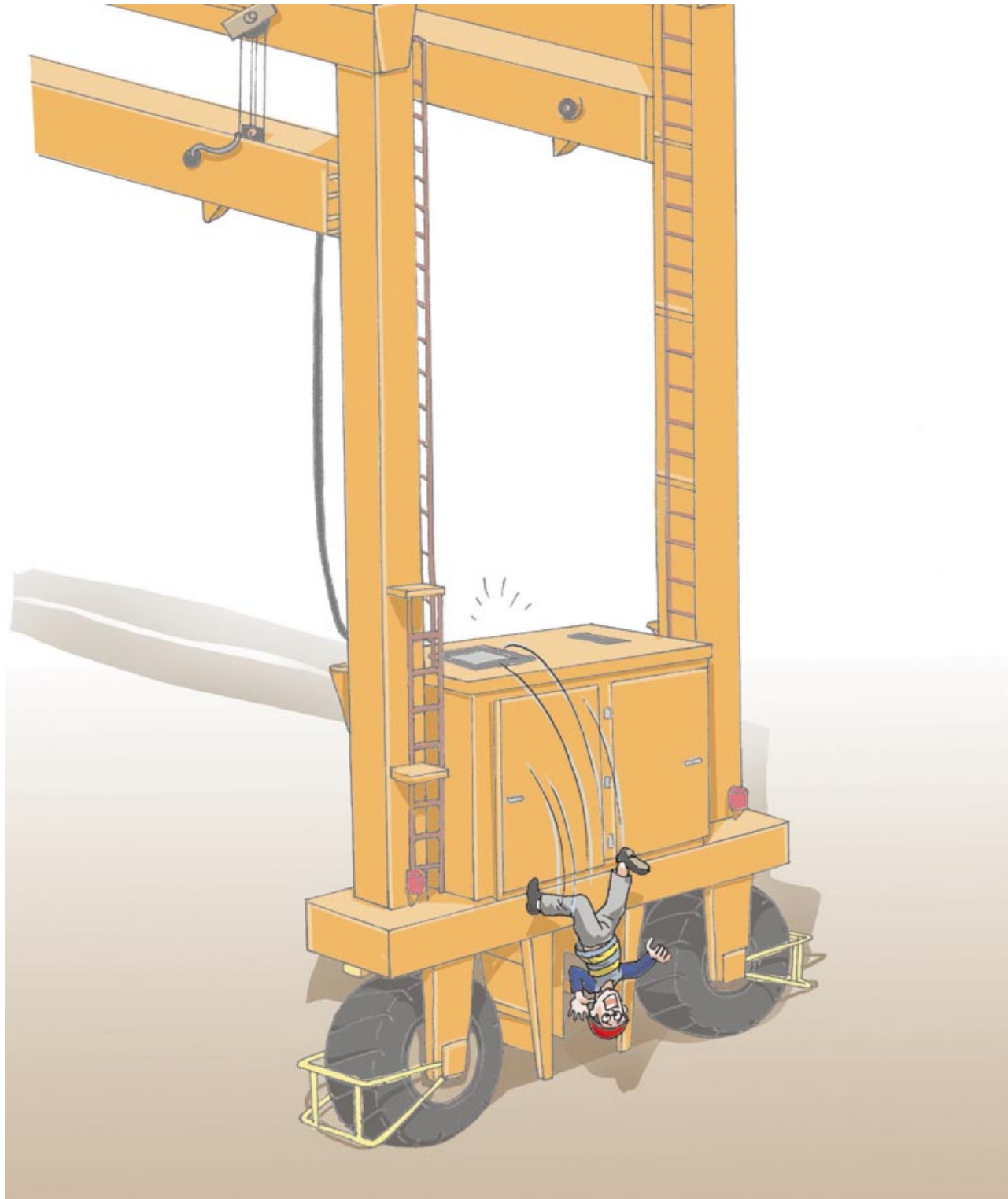
- The used electrical appliances were loosely stacked in the receptacle. They were not fastened or tied to the receptacle.
- The receptacle holding the electrical appliances was not provided with suitable enclosure. Some of the electrical appliances protruded beyond the edges of the receptacle.
- Under undue external disturbance during the lifting operation, the electrical appliances stacked on the receptacle would be easily displaced and fell outside the receptacle.
- No fencing or railing was erected along the edges of the shore.

Lessons to learn

- Every load being raised, suspended or lowered by a lifting appliance should be properly stacked and adequately secured to prevent slipping or displacement.
- Receptacle with suitable enclosure should be used to hold loose loads when being raised, suspended, lowered and transported.
- As far as practicable, with regard to the cargo handling operation, suitable guardrails or fences should be erected along the edges of the shore to protect workers from falling into the sea.
- Steps should be taken to ensure that no person stays in the path of travel of a lifted load.

Case 2

A worker fell from a height while dismantling a canopy fitted on top of a diesel generator set of a gantry crane.



Scenario

A team of eight workers, including the deceased person, was assigned to dismantle a diesel generator set from a gantry crane for maintenance in a container yard. The work sequence was to detach and remove the exhaust drum, the two canopies fitted along the top edges of the generator housing, then the generator housing, the diesel engine, the evaporator and finally the electricity generator. For the whole generator set to be lowered to the ground, preparatory work had to be done from the top surface of the generator housing. At the time of the accident, the deceased person gained access to the top of the generator housing and proceeded to unthread the bolts and nuts of one canopy. In the course of work, he might have stepped onto the loosened canopy or accidentally lost his balance and fell to the ground over the unprotected edge of the generator housing.

Case analysis

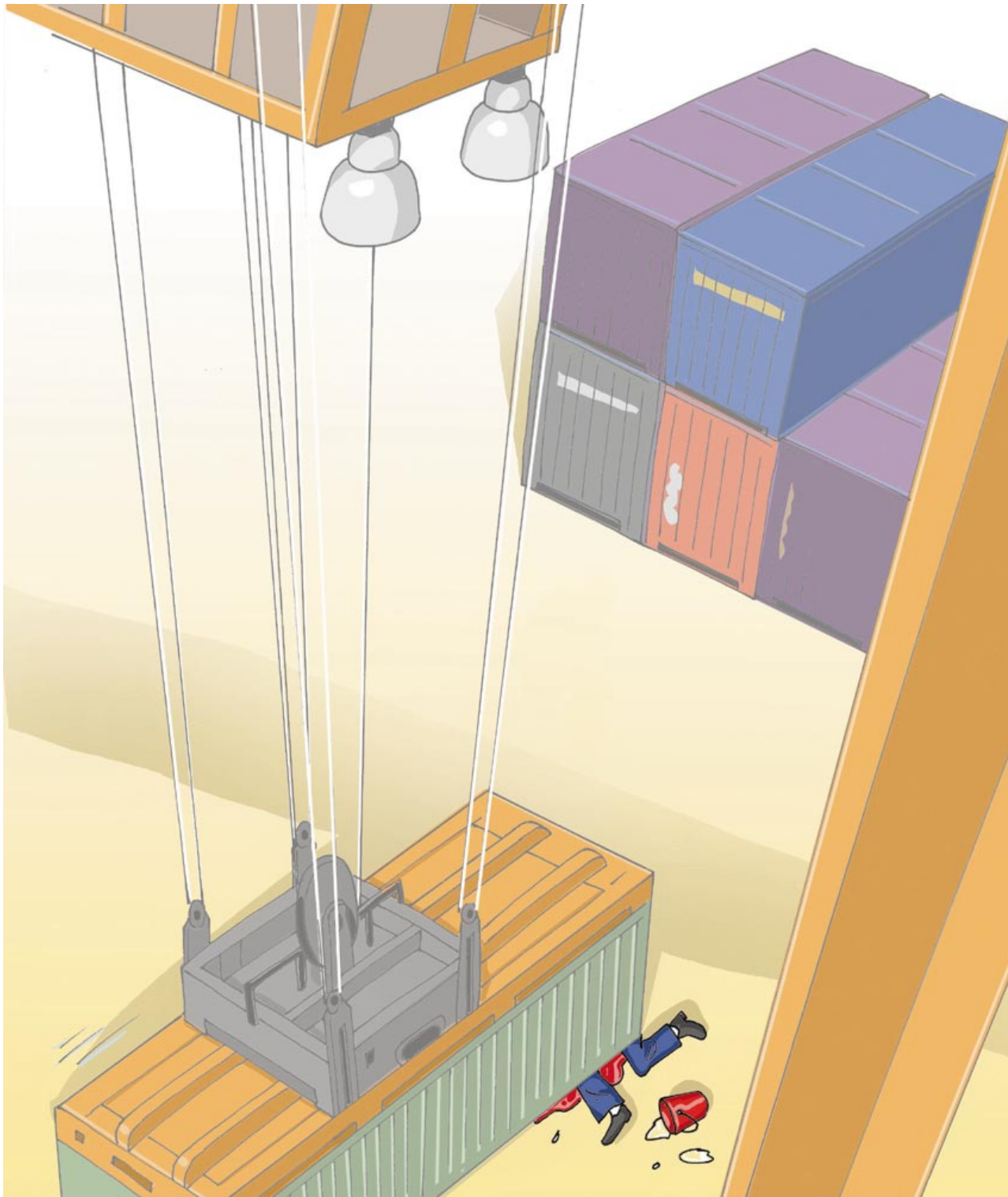
- The top of the generator housing was not provided with guardrails or fences.
- The deceased person had not made use of any fall protection equipment while working on the generator housing.
- No suitable anchorage for attaching the lanyard of the safety belt was available on top of the generator housing.

Lessons to learn

- (a) A safe system of work for the dismantling of diesel generator should be devised and implemented. It should include risk assessment to identify the hazards involved, formulation of precautionary measures to be taken and the means to ensure proper implementation of the plan.
- (b) Suitable working platforms should be provided and used for the dismantling work.
- (c) When the use of working platforms is impracticable, safety harness and suitable anchorages should be provided to prevent fall of person.
- (d) Adequate information, instruction, training and supervision should be provided to workers to ensure their safety while working at heights.

Case 3

A cleaning worker was crushed to death by a container that was being unloaded onto the ground by a gantry crane.



Case 3

Scenario

The deceased person was employed by a contractor responsible for cleaning work in a container yard. Before the accident happened, she was sweeping the tractor lanes of the main streets in the yard with a broom and a spade. When she passed by the junction of two main streets, she found some rubbish in an empty container stacking area. She then entered the stacking area to clean the place up. At that moment, a gantry crane approached this area to unload a container onto the ground. The deceased person was unfortunately trapped under the container being lowered.

Case analysis

- There was no co-ordination of work between the management of the container yard and the contractor undertaking the cleaning work.
- There was no instruction and guideline given to the cleaning workers concerning the conditions that would be safe for them to enter the container stacking area to perform cleaning work.
- The view of the crane operator in his cabin would be obstructed when a container was being lifted by the spreader of the gantry crane. The crane operator could not clearly see the area on the ground. The visible area would be further reduced when the container was gradually lowered to the ground.
- Although a closed circuit television system was installed in front of the crane operator cabin, it was only for monitoring the condition of the containers below the gantry crane and could not capture a clear view on the ground.
- There was no signaller appointed to assist in the container handling operation.

Lessons to learn

- (a) The management of the container yard should co-ordinate with the cleaning contractor to develop and implement a safe system of work so as to ensure the safety of all cleaning workers in the container yard.
- (b) The cleaning contractor should assign a supervisor to co-ordinate with the management of the container yard on the cleaning arrangements and to oversee the safety of the cleaning operations.
- (c) Appropriate measures should be taken to ensure that no cleaning work is carried out in the area where container handling activities or operation of cranes are in progress.
- (d) Adequate training and information on the hazards associated with the cleaning work in the container yard should be provided to all cleaning workers.
- (e) To ensure safety of the lifting operation, a signaller should be appointed to assist the gantry crane operator who did not have a clear and unobstructed view of the ground.

Case 4

A worker fell from a height while releasing a jammed container door.



Case 4

Scenario

The deceased person was engaged in unloading goods from a 20 feet container loaded on a truck parked in the loading bay of a warehouse. He found that the locking mechanism on the left container door was deformed and the door could not be opened. Intending to fix the problem, he placed a wooden pallet on the forks of a forklift truck and asked a co-worker to raise him to the top of the container. He stood on the pallet and brought with him a jack. After being raised to the top level of the container, he set up the jack on the wooden pallet and tried to restore the locking mechanism so as to release the jammed door. However, the jack accidentally displaced. The deceased person thus lost balance and fell to the ground.

Case analysis

- Neither the top of the container nor the wooden pallet being raised by the forklift truck was provided with suitable guardrails and toe boards.
- There was no safety measure taken to prevent the worker from falling from heights. In this incident the deceased person did not make use of any fall arresting equipment.
- No precaution was taken to prevent the accidental displacement of the jack.
- Without gaining access to the top of the container, it was practicable to pull open the jammed door by the forklift truck with the aid of a wire rope.

Lessons to learn

- (a) No person should work on the top of a container unless adequate precautions have been taken to prevent him from falling from heights.
- (b) Where practicable, working platform with suitable guardrails and toe boards should be used for work at heights.
- (c) No person should work on a wooden pallet rested on the forks of a forklift truck.
- (d) Deformed locking mechanism of the container should be repaired by a competent mechanic with suitable tools and equipment and in a manner that is safe and without risk.

Case 5

A worker riding on the fork of a forklift truck fell and was rolled over by the forklift truck.



Scenario

The deceased person was responsible for handling cargoes in an air freight forwarding centre. Before the accident happened, he was unloading cargoes together with two co-workers at Unit G9 with the aid of a forklift truck. After the work was completed, they proceeded to Unit G53 to perform other loading operation. The deceased person and one of the co-workers rode respectively on the two forks of a forklift truck, which was operated by another co-worker. When on their way to Unit G53, the deceased person accidentally lost balance and fell from the fork to the ground. The co-worker driving the forklift truck immediately applied the brake to stop the truck but it could not come to a dead stop at once. The forklift truck thus rolled over the lower part of the deceased person's body.

Case analysis

- There was a notice on the body of the forklift truck warning workers not to ride on the forks.
- Safety training on cargo handling operations, including the prohibition of riding on the forks of a forklift truck, had been provided to every employee employed as manual labourer. The workers were also issued with a safety manual and other related pamphlets during the training sessions.
- The workers were aware that forklift truck should not be used for transportation of people and they were not allowed to ride or stand on the forks of a forklift truck.
- The operator had about eight years' experience in operating forklift truck.
- The driveway from Unit G9 to G53 was paved with concrete, level and wide enough for the forklift truck to operate safely.

Lessons to learn

- (a) A safe system of work on the use of forklift truck should be developed and implemented.
- (b) In addition to the provision of information, instruction and training to the workers, an effective system of supervision should also be implemented to ensure that safe working practices and procedures are fully adopted.
- (c) Every worker should co-operate with the proprietor of the workplace and take reasonable care for the safety and health of himself and others who might be affected by his acts or omissions at work.

Case 6

A warehouse keeper was trapped between a forklift truck and the goods stacked in a container.



Scenario

Loading of goods into containers was being carried out in a container depot. The deceased person was responsible for assuring goods were correctly loaded into the respective container. Before the accident occurred, the deceased person had finished checking a container but found the doors could not be closed because the loaded goods were not properly stacked into the container. He then arranged a forklift truck installed with a pushing block at the front to compact the goods by pushing them further into the container. In the course of pushing the goods into the container, the deceased person was trapped between the pushing block of the truck and the goods in the container.

Case analysis

- The pushing block on the forklift truck consisted of a metal frame with a concrete base and a vertical metal plate at the front. There was no opening or perforation on the metal plate.
- The operator did not have a clear and unobstructed view in front of the pushing block installed on the forklift truck. He had only a limited view of the upper part of the container.
- To push goods at an elevated level, the pushing block had to be raised. In so doing, the view of the driver would be seriously obstructed.
- There was no signaller appointed to assist the forklift truck operator in this goods compacting operation.

Lessons to learn

- (a) Goods in the container should be properly stacked to avoid obstructing the closing of the container doors.
- (b) To ensure the safety of workers engaged in the goods compacting work, risk assessment to identify the hazards involved should be conducted and appropriate safe working procedures should be devised.
- (c) The pushing block used for compacting goods into the container should be suitably designed and constructed with perforation or opening on it so that the view of the forklift truck operator would not be obstructed.
- (d) Signaller should be appointed to assist in the compacting operation if the forklift truck operator could not have a clear and unobstructed front view.

Case 7

A forklift truck crashed into the gate of a cargo lift and fell into the lift shaft.



Scenario

The deceased person, a co-worker and a forklift truck operator were responsible for loading lorries parked at the 1/F loading bay with rice stored on the 2/F and 3/F of the warehouse. Three forklift trucks were available for use. One was located on the 3/F and the other two on the 1/F. The deceased person and his co-worker had to stack packs of rice onto wooden pallets on the upper floors. The pallets would be transported by the forklift truck into the cargo lifts for transferring to the 1/F, where they would be picked up by another forklift truck for loading onto the lorries. Prior to the accident, the forklift truck operator parked the forklift truck in the lift hall on the 3/F and went down to the 1/F to continue with the loading work. By that time, the deceased person was alone on the 3/F. He got into an unattended forklift truck and attempted to operate it. In doing so, the forklift truck hit the lift gate, damaged and derailed it. The deceased person thus fell with the forklift truck into the lift shaft down to the 1/F below.

Case analysis

- The deceased person was a trainee in the warehouse. The day of the accident was his second working day.
- The deceased person was left to work alone on the 3/F without any supervision.
- No formal training was provided to the deceased person. He was put under the guidance of a foreman and trained on the job.
- The forklift truck operator had to operate three trucks at three different locations in the warehouse.
- The operator did not apply the parking brake and remove the ignition key from the forklift truck when he parked and left the truck in the lift hall at the 3/F.
- No warning notice to prohibit unauthorised use of the forklift truck was displayed on the forklift truck or at prominent places in the warehouse.

Lessons to learn

- (a) A safe system of work should be devised and implemented to ensure the safety of all workers working in the warehouse.
- (b) Adequate information, instruction and training as were necessary to ensure safety should be provided to the workers. As far as practicable, trainees should work under the direct supervision of competent persons.
- (c) A forklift truck left unattended should have the parking brake applied and the ignition key removed.
- (d) Unauthorised use of forklift truck should be prohibited. Warning notice should be displayed on the forklift truck or at prominent positions in the warehouse.

Case 8

A security guard was knocked down and rolled over by a front loader in a container yard.



Scenario

The deceased person was employed as a security guard. He was responsible for directing traffic and recording information of container trucks entering into the container yard. There was an open ground adjacent to the security post, where containers were relocated by front loaders. Everyday, the deceased person had to walk across this open ground to go to toilet. At the time of the accident, a front loader was in operation on the open ground. Having relocated a container, the operator reversed the front loader intending to pick up another container. The deceased person was at the moment walking across the open ground. He was knocked down and his body rolled over by the front loader.

Case analysis

- There was no physical segregation to prevent the entry of persons into the open ground. No warning notice prohibiting the entry of persons into the open ground was displayed.
- The deceased person was not warned of the hazards associated with the operation of the front loader. He was not provided with such information and instruction as were necessary to ensure his safety.
- The management of the container yard had not taken any action about the deceased person going to the toilet everyday by crossing the open ground.
- The view of the front loader operator was partially obstructed by the left and right columns of the vertical mast. There were blind spots in front of the loader.
- Two convex mirrors were mounted on both sides of the front loader for the operator to view the condition at the rear of the machine. The rear view in the side mirrors was also partially obstructed by the driving cabin. There were also blind spots at the rear.

Lessons to learn

- (a) The operating area of the front loader should be physically segregated to prevent the entry of persons on foot.
- (b) Persons working in a container yard should be adequately trained, and provided with suitable information and instruction as were necessary to ensure their safety and health at work.
- (c) A monitoring system should be implemented to ensure that no person travelling on foot would enter into an area where container-handling activities were in progress.
- (d) Suitable devices should be installed on the front loader to enable the operator to have a clear front and rear view of the loader.

Case 9

A container checker was knocked down by a reach stacker in a container yard.



Scenario

The deceased person was directed to record identifications of containers on a barge berthed at the container yard. To go to the barge, he walked on foot from the checker's room right across the container-handling yard. A reach stacker was at that time stacking containers at Section 3 in the yard. After stacking, the operator intended to drive the stacker to Section 2 for further operation. While the stacker was reversing into an open access of Section 3, the deceased person happened to walk by. The stacker operator failed to notice that the deceased person was walking close to the reversing stacker. The deceased person was also unaware of a reach stacker reversing at him from his back. As a result, the stacker knocked down the deceased person and rolled over his body.

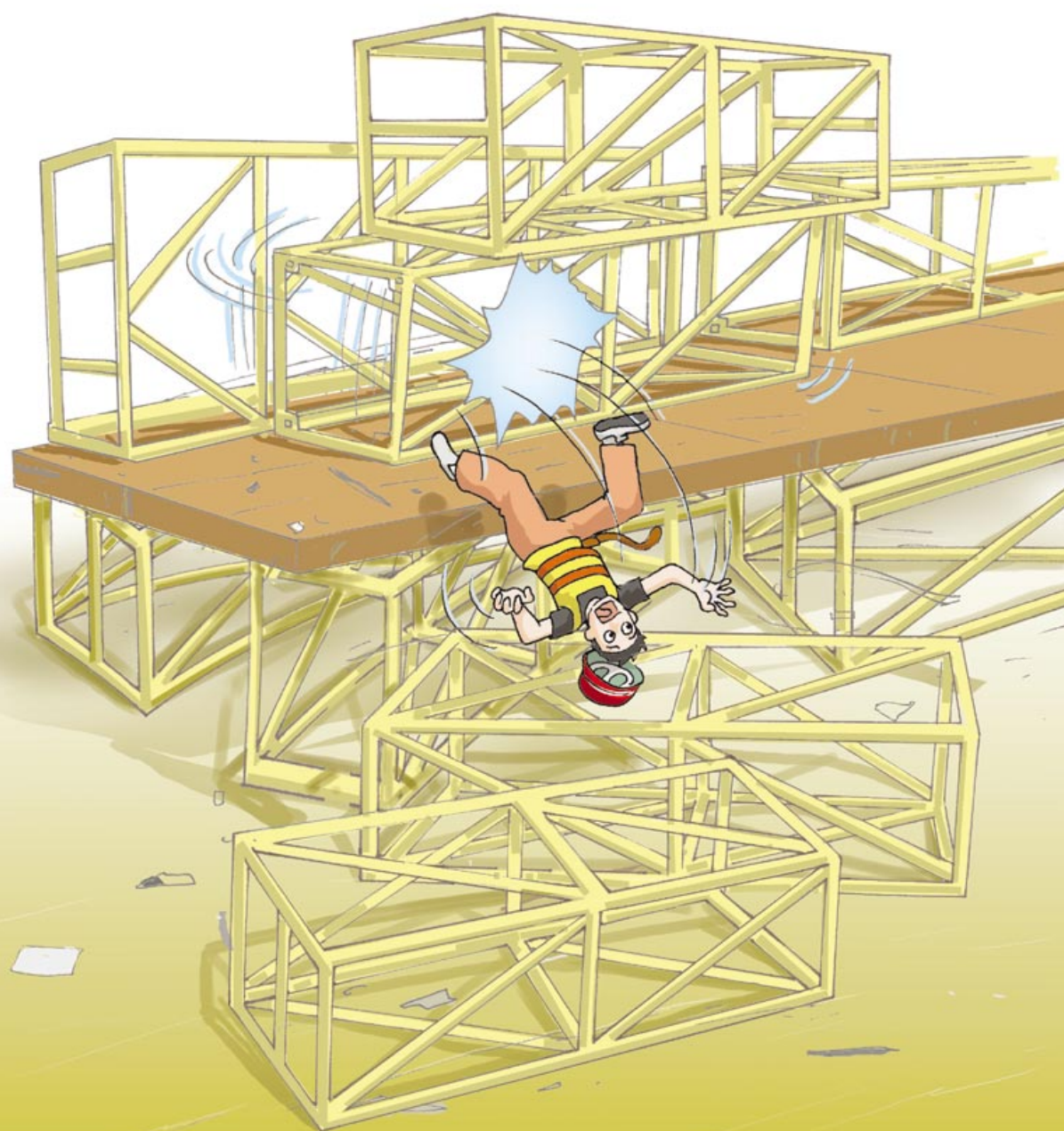
Case analysis

- In this container yard, container stacking machines and container trucks moved in all directions inside the stacking area. Checkers would walk across sections to perform their duties. They usually walked on the streets with moving traffic.
- There was no demarcation on the streets and sections in the container yard to separate persons from vehicles. There was also no sign to control the direction of traffic in the container yard.
- The reach stacker operator could not have a clear and unobstructed rear view when he was sitting inside the driver's cabin. Blind spots were created by the lifting mast of the stacker. No additional safety device was installed to eliminate the blind spots at the back of the stacker.

Lessons to learn

- (a) A safe system of work should be devised and maintained for checkers to gain access to various sections in container yard to perform their duties.
- (b) The container handling areas should be demarcated as "Restricted Zone". Unless authorised, personnel accessing on foot into these areas should be prohibited.
- (c) Safe working procedures should be developed, such as adopting a "Permit-to-Work" system, to cater for the situation where checkers are required to enter the "Restricted Zone" on foot.
- (d) Pedestrian pavements, vehicles routes and directions of traffic should be well defined and demarcated in the container yard.
- (e) Suitable safety devices should be installed on the reach stacker to eliminate the blind spots at its rear. The devices should also be properly maintained in good working order at all time.

A worker was struck by a displaced tower crane jib member while performing rigging work in a storage yard.



Scenario

Parts of a dismantled tower crane were to be transported by truck cranes from the storage yard to a construction site for installation. The deceased person was the rigger employed by a transportation company. He was responsible for hooking and unhooking wire ropes to and from the dismantled tower cranes parts and giving signals to the truck crane operator during the lifting operations. At the time of the accident, the deceased person was working alone. He was going to attach a wire rope to a tip section of the crane jib. This tip section was rested on a stage platform on another end section of the crane jib. The stage platform was 2.15 m above the ground whereas the top of the tip section was 3.48 m above the ground. To reach the point of hooking on the tip section, the deceased person had to climb up the dismantled jib sections stacked there. In so doing, the stability of the jib sections was disturbed and the tip section toppled. The tip section displaced and struck onto the deceased person.

Case analysis

- Risk assessment was not conducted before the lifting operation.
- Suitable scaffold, ladder or other means of support was not provided for the use of the rigger to perform rigging work at an elevated position.
- Adequate training as was necessary to ensure the safety at work of the rigger was not provided.
- The rigger engaged in such high-risk work activity was not supervised. He was left alone to perform the task.

Lessons to learn

- (a) A safe system of work for the transportation of tower crane parts should be devised and implemented. The system should include the followings:
 - (i) Risk assessment should be conducted to identify the hazards of hooking, lifting and unhooking of stacked loads.
 - (ii) Safe working procedures for the lifting operation should be devised and implemented.
 - (iii) The workers should be provided with adequate information, instruction and training in relation to the transportation of dismantled tower crane parts.
 - (iv) Qualified safety personnel should be appointed to ensure that the lifting operation is carried out in accordance with the safe working procedure.
 - (v) The workers engaged in high-risk work activities should be suitably supervised.
- (b) No person should climb on stacked loads to avoid disturbing stability of the loads.
- (c) Suitable scaffolds, ladders or other means of support should be used to provide access for the rigger. Steps should also be taken to ensure that the rigger make full and proper use of the scaffolds, ladders or means of support provided.

ENQUIRY

If you wish to know more about occupational safety and health information, you may contact Occupational Safety and Health Branch of the Labour Department through -

Hotline : 2559 2297

E-mail : enquiry@labour.gov.hk

Information on the services offered by Occupational Safety and Health Council can be obtained through hotline 2739 9000.

Complaints

If you have any complaints about unsafe workplaces and practice, please call the Labour Department's occupational safety and health complaint hotline at 2542 2172.