

Lifting-related Workplace Fatal Injuries in 2H2023

Lifting operations are high-risk work activities. In 2023, there were three fatal accidents involving lifting operations that went awry. Every lift carries WSH risks that must be carefully managed to prevent an incident. Typically, detailed planning and risk assessment are done for complex lifting operations such as tandem lifting.

The WSH Council would like to remind companies to pay attention to **routine lifts** to ensure they too are carried out safely. The three fatal accidents described below are all routine lifts and they serve as a reminder that we must take every lifting operation seriously to prevent unnecessary loss of lives.

Worker struck by hoisted container

On 28 August 2023 at about 6am, a worker was on board a vessel guiding the quayside crane operator to load a pair of 20-foot containers onto the vessel. During the operation, the worker was struck by the sudden movement of the bottom containers which had earlier been loaded onto the vessel. The worker was sent to the hospital where he died the same day.

The sudden movement of the bottom container that struck the worker, was likely due to the lifting of other containers that were in the process of being stacked above the said bottom container at the time of the incident.

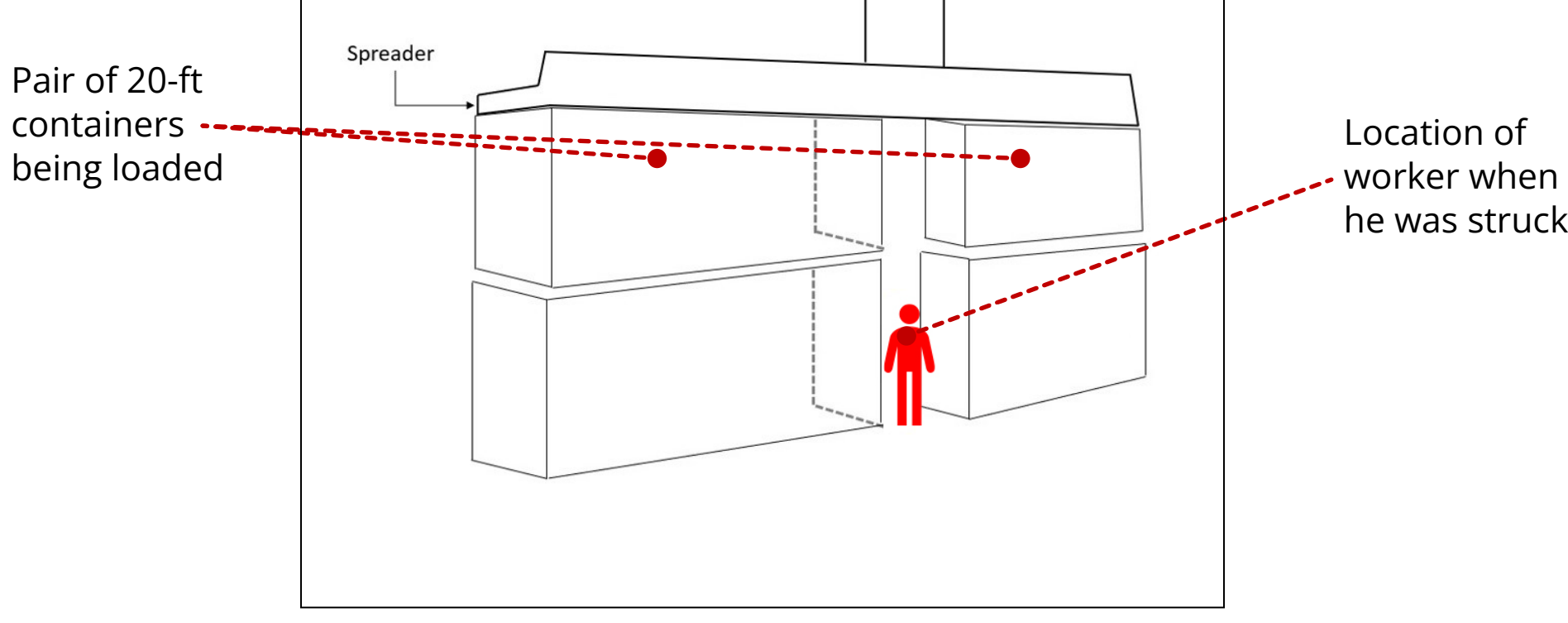


Figure 1: Schematic diagram of the accident.

Worker struck by toppled cylinder pallet

On 16 September 2023, two workers were assisting in the unloading of materials from a lorry bed using a crawler crane. The items to be unloaded included two 10-metre long 2-legged chain slings. During the operation, the hook of one of the chain slings entangled with the base of a cylinder pallet (weighing about 1.3 tons), causing the pallet to topple and fall onto one of the workers standing behind the pallet. The worker was rescued and sent to the hospital but unfortunately, he died on the same day.



Figure 2: Re-enactment of the accident scene.

Worker struck by suspended waste bucket

On 9 October 2023, a worker was on the tenth storey of a building under construction. He was guiding a crawler crane operator to lift a material waste bucket from the tenth storey to the ground level. When the bucket was lifted, it suddenly swung and struck the worker. The impact knocked both the worker and nearby fall-protection barriers off and the worker fell to the ground. The worker did not survive the fall.



Figure 3: Overview of the accident scene.

What companies should do

Companies should consider the following risk control measures when performing lifting operations to prevent similar accidents:

- **Lifting Plan (LP):** Establish a LP to ensure that the lifting operation can be carried out safely. The LP should cover elements such as the lifting sequence, method and path, load details, rigging method, sketch of the lifting zone, permit-to-work system, means of communication between lifting team members, and safe position(s) workers are to adopt during each lifting operation. Before each lift, check for the presence of obstacles that can hinder load manoeuvring or result in the creation of entrapment points especially in congested work areas.
- **Competent Lifting Team (LT):** Deploy only LT members who have been trained for their respective roles (e.g. crane operators, lifting supervisors, signalmen, container lashing specialists). Crane operators must be trained/briefed to operate the make and model of crane used onsite and be familiar with any unique features of the crane.
- **Proper rigging method:** Loose items (e.g. waste materials) should be placed in a suitable lifting container and secured (e.g. using a net). Ensure that the load is stable and balanced when it is rigged up (i.e. the load's centre of gravity should be beneath the lifting hook).

When there are unused slings, check for the possibility of sling entanglement with nearby objects. Ensure unused slings are properly hooked up before lifting (see Figure 4). Never leave unused slings unhooked as the hook can latch onto stray objects and jeopardise the lift.

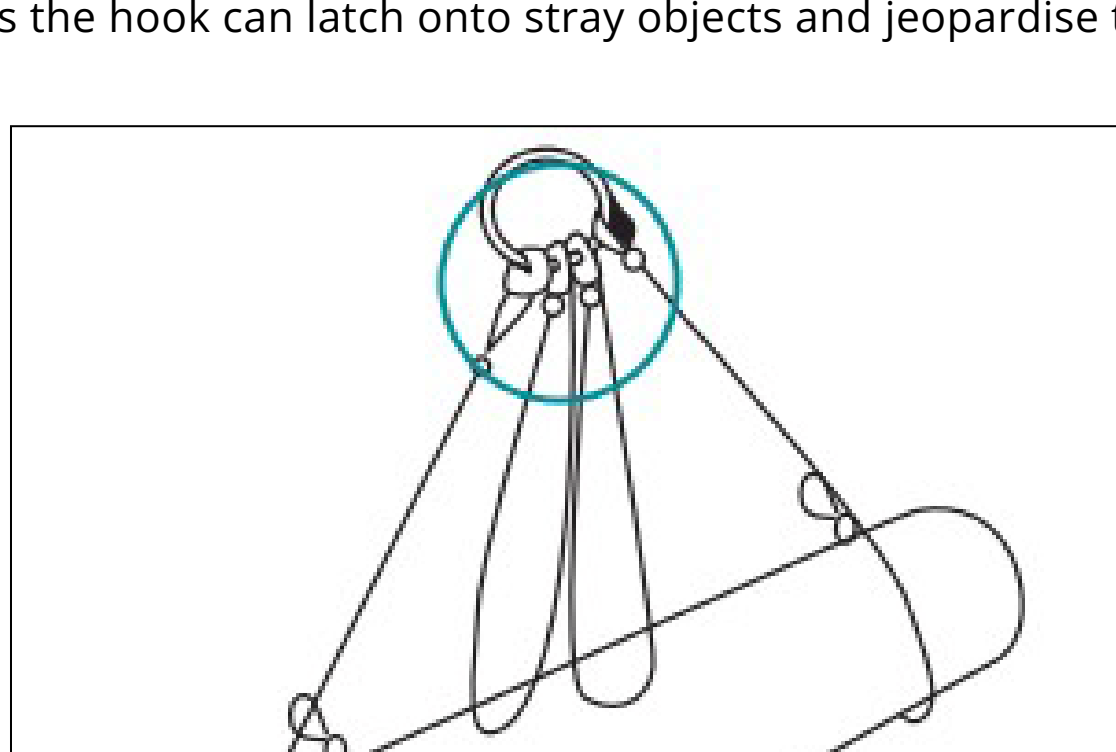


Figure 4: Hook up unused slings.

- **Safe work position:** Instruct workers to stay clear of the lifting zone during lifting operations and maintain a line of sight to the load as much as possible. Workers must never position themselves under a suspended load or next to an object which can topple, shift or swing as a result of the lifting operation. Taglines may be used to control the movement of a suspended load. Authorise crane operators to stop the lift if there are persons in the lifting zone.
- **Test lift:** Perform a test lift by lifting the load slightly off the ground and stopping to observe for abnormalities. This is to ensure the load's stability and confirm no overloading before proceeding with the full lift.

Best practices: The "3-3-3" method is a common industry practice to ensure safe lifting operation. The method involves personnel staying 3m away from the load, lifting the load for 30cm for 3 seconds to ensure stability before moving the suspended load to its destination.

- **Safe work environment:** Allow lifting activities to proceed only if environmental factors such as workplace lighting, weather, wind and sea condition are conducive for safe loading/unloading.
- **Effective communication:** Require lifting supervisors to communicate possible WSH risks to the lifting team before each lifting operation. Empower all lifting team members to stop the lift (see Figure 5) once an unsafe situation is spotted. Provide a means for lifting team members to communicate (e.g. using standard crane hand signals or radio communication devices). To avoid misunderstanding when using radio communication, ensure that the lifting team understands each other. This is important given the diverse nationalities and languages amongst workers deployed onsite.

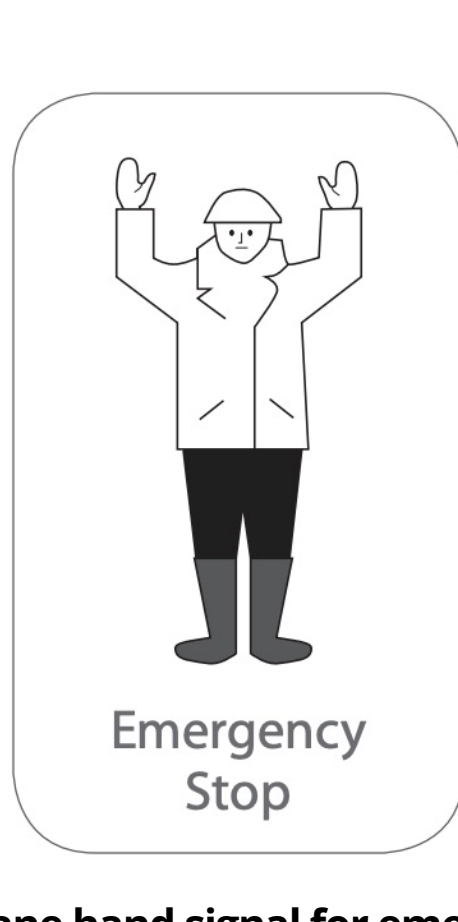


Figure 5: Crane hand signal for emergency stop.

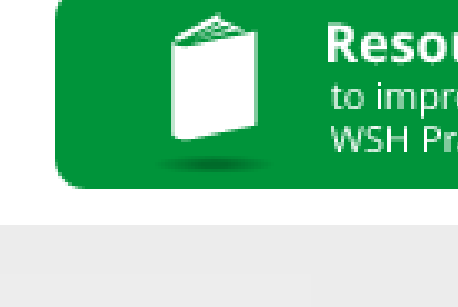
- **Work supervision:** Provide onsite supervision to ensure the load has been properly rigged, workers are in safe positions and lifting operations are carried out according to the LP.
- **Use of technology:** Consider installing a video camera (e.g. at the tip of the boom or crane's hook block) with live video feed to enable the crane operator to have a close-up view of the load's initial location, placement, alignment, and final destination.

For more information, refer to the WSH (Operation of Cranes) Regulations 2011, SS 536: 2008 Code of Practice for the Safe Use of Mobile Cranes, SS 663: 2020 Code of Practice for Safe Loading on Vehicles, the WSH Council's [Code of Practice on Safe Lifting Operations in the Workplaces](#), [Code of Practice for Working Safely at Height](#), [WSH Guidelines on Lifting Plan Development](#), [Guidebook for Lifting Supervisors](#), [Worker's Safety Handbook for Rigger and Signalman](#), and [6 Basic WSH Rules for Lifting Operations](#).

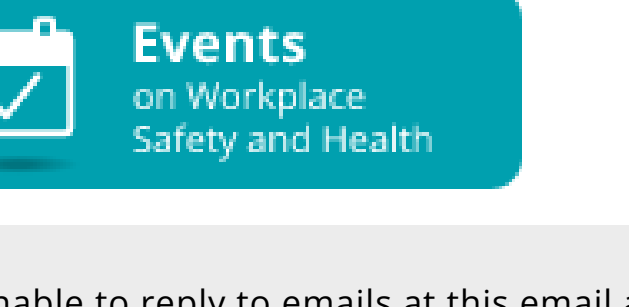
Other relevant resources include BS 7121-2-9: 2013 Code of Practice for the Safe Use of Cranes - Inspection, Maintenance and Thorough Examination – Cargo Handling and Container Cranes, ISO 3874: 2017 Series 1 Freight Containers — Handling and Securing, [SIP0003 Guidance on Container Handling](#) by Health & Safety Executive and Port Skills and Safety UK, and [Working Safely with Containers](#) by Safe Work Australia.

Under the WSH Act, first-time corporate offenders may be sentenced to the maximum fine of \$500,000 whilst individuals can either be sentenced to the maximum fine of \$200,000 and/or an imprisonment not exceeding 2 years. Read more on the [WSH Act penalties](#).

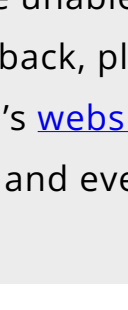
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