

AS PART OF THE CASE STUDY MATERIAL, THE FOLLOWING COMMENTARY PROVIDES FURTHER ANALYSIS OF SOME OF THE KEY ISSUES TO SUPPORT REFLECTIVE LEARNING.

The first four pages of this commentary discuss some of the contributory factors and lessons learned in more detail with particular reference to best practices. The final page illustrates graphically some of the barrier control measures that could have potentially mitigated against the risks associated with the hazards using Britannia's interpretation of the Hierarchy of Barrier Controls triangle as a framework.

## SCAFFOLDING FALL CAUSES SERIOUS INJURIES

**THE USE OF MOBILE SCAFFOLD TOWERS HAS BECOME A RELATIVELY COMMON PRACTICE ON BOARD SHIPS, IN PARTICULAR ON BULK CARRIERS.** HOWEVER, THEIR USE HAS ALSO RESULTED IN A NUMBER OF SERIOUS INCIDENTS. IN THIS PARTICULAR CASE, THE DECISION BY THE TWO CREW MEMBERS TO REMAIN ON THE SCAFFOLDING WHILE IT WAS BEING REPOSITIONED LED TO THE TOWER BECOMING TOP-HEAVY AND TOPPLING.

Although this was the major factor contributing to this incident, the investigation and this case study have identified a number of other factors and lessons learned, as discussed below.

### SAFE WORK PRACTICES

On the morning of the incident it was reported that the bosun and able seamen (AB) had been following established best practices by dismantling the scaffolding each time it was repositioned in hold No.1. However, during the afternoon they decided to remain near the top of the tower while it was being moved in hold No.4. This would have made the scaffolding top-heavy and unstable while the tower was being rolled into its new position and would therefore have contributed to the scaffolding toppling when the supporting lines were removed to move the tower forward adjacent to the hopper tank edge.

Both the bosun and AB were experienced seafarers and aware of the procedure that had been followed in the morning. Although the reason for their decision to deviate from safe practices was not determined by the investigation, it may have been motivated by a desire to complete the task as quickly as possible in the hot conditions or it could have been due to complacency. Either way, this decision demonstrated the inherent risks moving scaffold towers while people or materials are on the structure.

### SAFETY PROCEDURES

The company's Safety Management System (SMS) classified working aloft as a special operation and required that 'all mandatory international and national regulations' be complied with. It also required crew members to be qualified for such tasks and that a maintenance plan and risk assessment be undertaken.

The only onboard documentation relating to the provision, care and use of the scaffolding was an 'operation manual' page for a different design of scaffolding to the one in use on the ship. However, this did state that the scaffolding should not be moved with persons on it. The incident would probably have been prevented had this precaution been followed, irrespective of the fact that it referred to a different design of scaffolding.

Specific guidance for the scaffolding equipment on board the ship would have supported the training and familiarisation of the crew, as well as addressing the specific practices required to ensure its safe operational use. Such guidance would also have ensured that the correct levels of maintenance would have been adhered to and which would have helped identify and rectify the damage and wear that was evident on the scaffolding equipment after the incident.

The latest edition of the UK's Code of Safe Working Practices for Merchant Seafarers (COSWP)<sup>1</sup>, was on board the ship.

<sup>1</sup>United Kingdom's Maritime and Coastguard Agency (2020), Code of Safe Working Practices for Merchant Seafarers 2015, since amended in 2020. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/938726/Code\\_of\\_Safe\\_Working\\_Practices\\_for\\_Merchant\\_Seafarers\\_Amendment\\_5\\_Oct\\_2020\\_v.2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938726/Code_of_Safe_Working_Practices_for_Merchant_Seafarers_Amendment_5_Oct_2020_v.2.pdf)

## **SCAFFOLDING FALL CAUSES SERIOUS INJURIES**

### **SAFETY PROCEDURES (continued)**

Chapter 17 of the COSWP provided guidance on Work at Height best practices on ships, including a specific section dealing with scaffolding. This included best practice guidance on matters such as scaffold plans, ensuring tower stability, preventing accidental movement, fall prevention and appropriate and specific scaffold/rigging training. Although at the time of the incident the published version of COSWP did not specially highlight the concerns about moving scaffolding with personnel on the structure, chapter 18 specifically stated that *'No seafarer is to be carried on any mobile work equipment unless it is designed for that purpose'*.

The latest 2020 edition of COSWP, section 17, now specifically states: ***Never move a scaffolding tower while people or materials are on the structure.***

This is a key precaution relating to the safe use of mobile scaffolding towers and should be adhered to at all times, regardless of distance that the scaffolding is being moved or any time pressure. If the guidance contained in the scaffolding operation manual page and the copy of COSWP on board the ship had been followed, the fall incident and resulting injuries would not have occurred.

The safe and successful completion of onboard tasks, such as hold maintenance, relies not only on the actions, behaviours and relationships of the people involved in the task but also the effectiveness of the SMS, including processes for non-conformity and near miss reporting, auditing and verification. This incident highlights the importance of adhering to procedures and best practices that help ensure safety.

### **RISK ASSESSMENT AND TOOLBOX TALK (TBT)**

Although the investigation made no reference to company requirement for permits to work for working aloft, the SMS did require a checklist and an 'on the spot' work assessment be completed to determine the active risk while working aloft, including any preventative measures. The investigation concluded that although a risk assessment and working aloft checklist had been completed for the task, these documents may have been prepared after the incident. The Port State Control inspection conducted shortly after the incident found no evidence of these documents, while the ship's crew could not supply copies of previous risk assessments and checklists for the use of the scaffolding, despite it having been used at least three times in the six months before the incident.

The proper completion of these documents before the work started should have identified and mitigated the risks associated with moving the scaffolding with personnel on it, as well as the various other risks associated with the use of the equipment. This would have included detailed consideration of the effective use of fall protection adequate for the circumstances, as discussed below.

The investigation noted that the company procedures did require a briefing to take place before working aloft, but only referred to the C/O having briefed the bosun about the task. There was no reference to a toolbox talk (TBT) having been conducted. A TBT usually consists of a short, job-specific meeting of all personnel involved in a task before it starts. The TBT facilitates proper consideration of the risk assessment and applicable procedures, as well as ensuring that everyone is aware of the risks, the plan for the task and their respective roles and responsibilities. The completion of a TBT before the task should have reinforced the fact that no personnel were to be on the tower while it was being moved.

### **USE OF SAFETY EQUIPMENT**

On the morning of the incident the crew members working on the scaffold tower in hold No.1 were using safety harnesses with the associated safety lines secured on the ship's main deck above the hold. This meant that the safety lines had to be repositioned every time the tower was moved and therefore were not in use while the crew members climbed or descended the tower. This arrangement does not represent best practice as there was nothing to prevent the crew members from falling when moving up and down the scaffolding.

## SCAFFOLDING FALL CAUSES SERIOUS INJURIES

### USE OF SAFETY EQUIPMENT (continued)

However, during the afternoon in hold No.4, neither of the crew members used the safety harnesses or lines available, even when they were working at the top of the tower. It is arguable that the use of the harnesses and safety lines may still not have prevented them from being seriously injured if their safety lines had become entangled in the collapsing scaffolding. The failure to use this equipment while working on, or moving around, the scaffolding was indicative of a missing or ineffective assessment of the risks for the work on the scaffolding. This assessment should have considered the most appropriate ways of attaching safety lines for all aspects of the task. This also suggests an inadequate onboard safety culture.

### TASK SUPERVISION

The company's procedures required the chief officer (C/O) to be in charge of any working aloft activities and for the duty officer to supervise any such task, which indicates the company recognised the increased risk of working at height. The C/O was present during the work in hold No.1 in the morning. However, in the afternoon he was resting and the second officer, as duty officer, remained on the bridge while the work was being carried out in hold No.4. Therefore there was no designated supervising officer during the afternoon, which suggests that, on this occasion, there was insufficient resourcing for the job.

It also meant that, by default, the bosun was responsible for the task, as the highest ranking crew member. Despite the absence of the duty officer, the bosun, with his seniority and experience, should have been able to ensure that the work involving the scaffolding was carried out safely and in accordance with the procedures and best practice. However, as he was actively engaged in the task itself, he was not in a position to step back and formally oversee and supervise the task. Formal supervision of the work by a dedicated officer in accordance with the procedures should have ensured that the activity was completed in accordance with the procedures. This in turn should have prevented the scaffolding collapse and resulting serious injuries.

### STOP WORK AUTHORITY (SWA)

An effective onboard Stop Work Authority (SWA) programme would also have prevented the incident from occurring by enabling any of the attending crew members to challenge the unsafe practices that were happening in the afternoon. This was especially the case given that the tower had been moved safely in the morning. A SWA policy provides crew members with the responsibility and obligation to stop work in case of an apparent unsafe condition or behaviour without fear of reprisal. This contributes to a positive and effective onboard safety culture, which also helps ensure that onboard procedures are followed and that a safety-first approach is proactively embraced by all crew members.

### SCAFFOLDING CONDITION

Inspection of the scaffolding following the incident identified a number of defects relating to damaged, loose and unserviceable components. This included missing securing pins on some connections, loose and bent cross bracing, loose cross brace locking pins and inoperative swivel wheel brakes on three of the four wheels. Furthermore, the scaffolding identification plate was missing.

Although the incident could not be directly attributed to any of the identified defective components on the scaffolding, these would have exacerbated the instability of the structure. Scaffolding should always be in good condition and fit for purpose before it is used. It should also always comply with the relevant standards and be suitable for the work to be carried out.

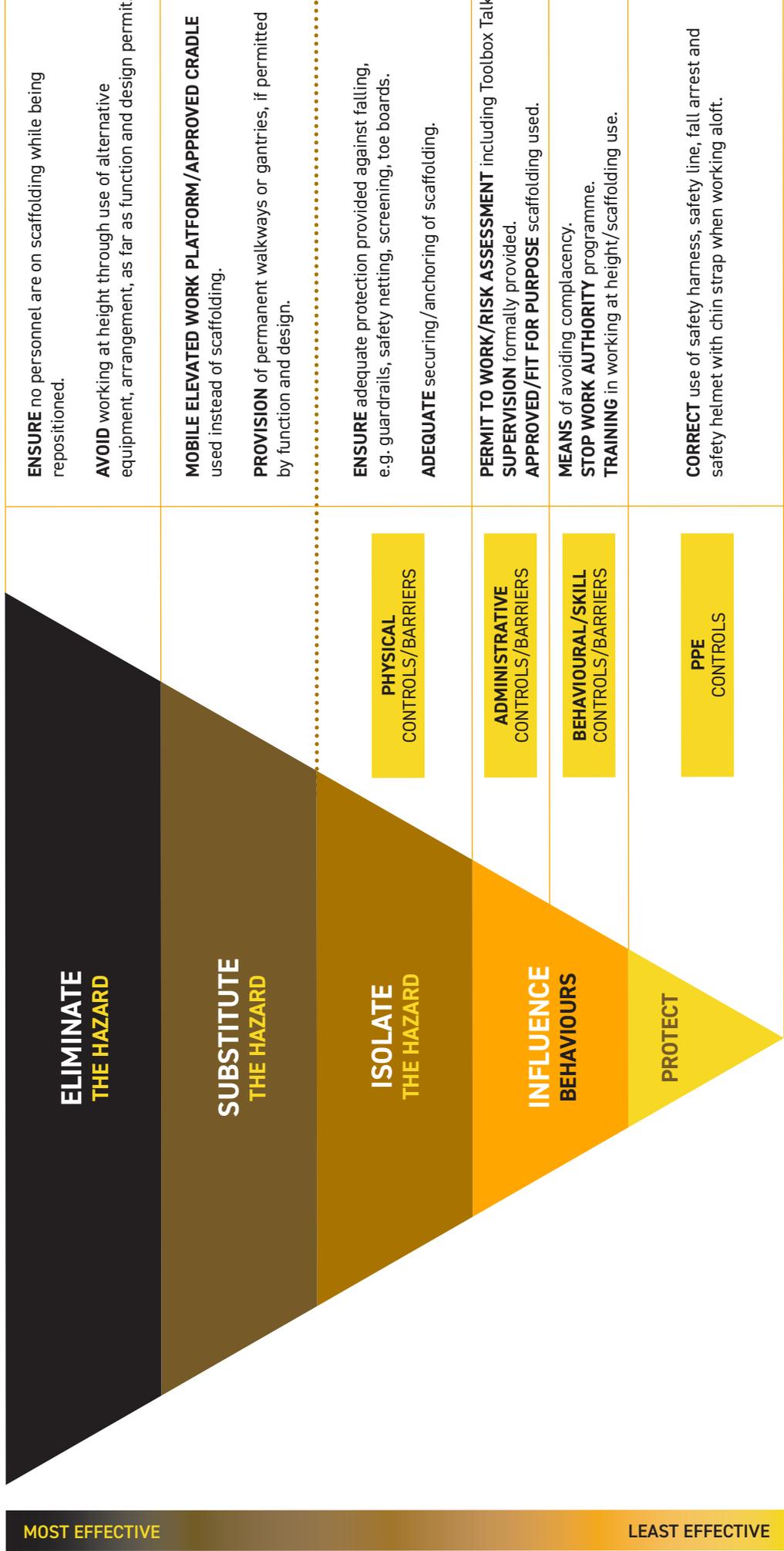
As detailed in Chapter 17 of the COSWP, the use of scaffolding involves a number of potential hazards which can be exacerbated by the structure not being properly used or maintained. Care should be taken when assembling and dismantling the scaffolding and anyone rigging or dismantling scaffolding should have had adequate training.

### SEE NEXT PAGE FOR HIERARCHY OF BARRIER CONTROLS DIAGRAM

THIS CASE STUDY IS DRAWN FROM THE INVESTIGATION REPORT 328-MO-2017-001 PUBLISHED BY THE AUSTRALIAN TRANSPORT SAFETY BUREAU (ATSB) AT: [https://www.atsb.gov.au/media/5775607/mo-2017-001\\_final.pdf](https://www.atsb.gov.au/media/5775607/mo-2017-001_final.pdf)

THE PURPOSE OF THIS CASE STUDY IS TO SUPPORT AND ENCOURAGE REFLECTIVE LEARNING. THE DETAILS OF THE CASE STUDY MAY BE BASED ON, BUT NOT NECESSARILY IDENTICAL TO, FACTS RELATING TO AN ACTUAL INCIDENT. ANY LESSONS LEARNED OR COMMENTS ARE NOT INTENDED TO APPORTION BLAME ON THE INDIVIDUALS OR COMPANY INVOLVED. ANY SUGGESTED PRACTICES MAY NOT NECESSARILY BE THE ONLY WAY OF ADDRESSING THE LESSONS LEARNED, AND SHOULD ALWAYS BE SUBJECT TO THE REQUIREMENTS OF ANY APPLICABLE INTERNATIONAL OR NATIONAL REGULATIONS, AS WELL AS A COMPANY'S OWN PROCEDURES AND POLICIES.

## HIERARCHY OF BARRIER CONTROLS



MOST EFFECTIVE

LEAST EFFECTIVE

The suggested barriers/controls above are provided to help generate reflective discussions, and should not be considered as conclusive/definitive or comprehensive for the provided case study. The risk and control measures relating to any similar scenario or activity must always be appropriately assessed based on the specific onboard arrangement and circumstances.