BSAFE

INCIDENT CASE STUDY No.12

BRITANNIA COMMENTARY | OCTOBER 2021

AS PART OF THE CASE STUDY MATERIAL, THE FOLLOWING COMMENTARY HAS BEEN PREPARED TO FURTHER CONSIDER SOME OF THE KEY ISSUES IN ORDER TO SUPPORT REFLECTIVE LEARNING.

The first two 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 graphically illustrates some of the barrier control measures that could have potentially mitigated against the risks associated with the hazards by making use of Britannia's interpretation of the Hierarchy of Barrier Controls triangle as a framework.

FATALITY INSIDE THE ELEVATOR SHAFT

THE CAUSES OF THIS INCIDENT APPEAR TO BE THE RESULT OF A PERSON, WHO IS NORMALLY KNOWN TO BE QUITE SAFETY CONSCIOUS BY HIS COLLEAGUES, SUDDENLY TAKING ON KNOWN RISKS IN ORDER TO COMPLETE A JOB, AND AS A RESULT COMPROMISING HIS OWN SAFETY. THE CONTRIBUTING FACTORS AND LESSONS LEARNED IN THIS CASE STUDY ARE DISCUSSED BELOW.

ACCEPTANCE OF RISK

As the electrician died due to his injuries, it was not possible for the investigation to definitively establish the exact reason why he chose to re-enter the elevator shaft on his own without informing anyone. At the time of the incident the electrician had been serving at sea for about 20 months as an electrician and had obtained his Certificate of Competency eight months before the incident. The ship's staff described him as very meticulous and safety conscious. The investigation described the risk taken by the electrician when entering the elevator shaft alone as being indicative of an Efficiency-to-Thoroughness Trade Off (ETTO).

ETTO can be defined as the trade-off that people have to make as part of their activities between the resources they spend on preparing to do something and the resources spent on actually doing it. The trade-off may favour thoroughness over efficiency if safety and quality are the dominant concerns, and efficiency over thoroughness if throughput and output are the dominant concerns[1]. Retrieving the plastic bottle inside the elevator shaft may have been perceived by the electrician as inconsequential and this, along with his meticulous approach to work and limited experience, may have led him, for a short but fatal moment, to accept known risks and prioritise efficiency over safety.

COMPLACENCY

Apart from an annual safety inspection carried out by an external technician, the onboard maintenance of the elevator involved a weekly check. As per the vessel's Planned Maintenance System (PMS), the weekly check included both an operational check and a close-up inspection of the elevator's various mechanical parts. In order to conduct the close-up inspections, it would have been necessary to enter the elevator shaft. Therefore, entering the elevator shaft would have become a routine occurrence for the electrician. This may have resulted in complacent behaviour where known risks are ignored due to a false sense of safety resulting from completing the activity without incidence in the past. This may have contributed to the electrician's decision to re-enter the elevator shaft without supervision.

Signs of complacency may include:

- work tasks being completed in a rush or "on autopilot" without due consideration for safety
- making basic assumptions about safety and conducting insufficient job hazard assessments (JHA)
- incorrect use of PPE or performing work activities without the required PPE.

Complacent behaviour may also result in an ETTO where an attempt is made to complete a task with insufficient manpower and/or time.

embedding and driving a strong onboard safety culture. The nature and number of the underlying causes points to the possibility that there had been a breakdown in both the safety management and culture on board, which led to the situation where there had been no collective will to admit and recognise the issues and rectify them.

[1] Erik Hollnagel: The ETTO Principle - Efficiency-Thoroughness Trade-Off

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RISK CONTROL MEASURES

Electrical power is required for the elevator car to travel up and down the elevator shaft when conducting inspection and maintenance work. This appears to be a safe practice as long as the person stays within the safety cage. However, as soon as the electrician moved outside the safety cage, he exposed himself to danger as the elevator's electrical system was still energised. The onboard SMS prescribed a Tag-Out system by placing warning signs at call buttons and places where the elevator could be operated from outside the elevator shaft. However, if work is to be conducted safely outside the boundaries of the safety cage, an effective Lock-Out system should also be implemented. This would have resulted in removing the hazard by de-energizing the elevator's electrical circuits, preventing any inadvertent operation of the machinery causing the elevator car to move. Furthermore, the brakes of the elevator would automatically engage preventing any movement.

FAMILIARISATION/TRAINING

The electrician had only obtained his Certificate of Competency eight months before the incident, so, although the investigation did not identify lack of familiarisation/training as a direct contributory factor, it did recommend the company to "provide specific training to personnel involved in elevator maintenance".

Structured familiarisation/training is best suited to provide seafarers with ship-specific information required for safe operations. This is also an opportunity to advise the crew on areas of elevated risk, as well as risk control measures, such as the requirement for two people to be present when a person enters the elevator shaft and the need for an effective lock-out of the electrical power system if work is to be conducted outside the safety cage provided.

RISK ASSESSMENT AND PROCEDURES

The investigation concluded that the work conducted by the electrician and EET had been planned and executed in compliance with the onboard SMS procedures. However, it was found that, while the company provided a risk assessment for 'Electrical Workshop Activities on the Elevator Cage', this only covered the use of PPE and did not include other related risks such as electrical isolation and safe entry to and exit from the elevator shaft. A risk assessment should cover the entire work operation. Had a thorough risk assessment been carried out prior to the work starting, it is likely to have captured and recorded the hazards associated with the various work activities necessary to complete the job, as well as the precautions to be taken in order to sufficiently mitigate them.

The onboard SMS inferred that no maintenance was to be carried out by ship's crew and that any defects were to be dealt with by an elevator service provider. The C/E's understanding was that this only referred to annual checks, whereas routine maintenance and servicing could be carried out by the ship's staff. This was also consistent with the instructions provided by the onboard operations manual, which required routine checks and on board maintenance to be done by the ship's staff. It is important procedures are clearly written and do not provide conflicting information, which may be misinterpreted, especially when it comes to work which due to its complexity and safety risk may only be conducted by trained professionals. It was further recommended by the investigation to *"review the maintenance, inspection and test operational procedures so as to specifically exclude all adjustment of limits by ships personnel unless supervised by an expert."*

SEE NEXT PAGE FOR HIERARCHY OF BARRIER CONTROLS DIAGRAM

THIS CASE STUDY IS DRAWN FROM THE INVESTIGATION REPORT PUBLISHED BY THE TRANSPORT MALTA MARINE SAFETY INVESTIGATION UNIT.

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.

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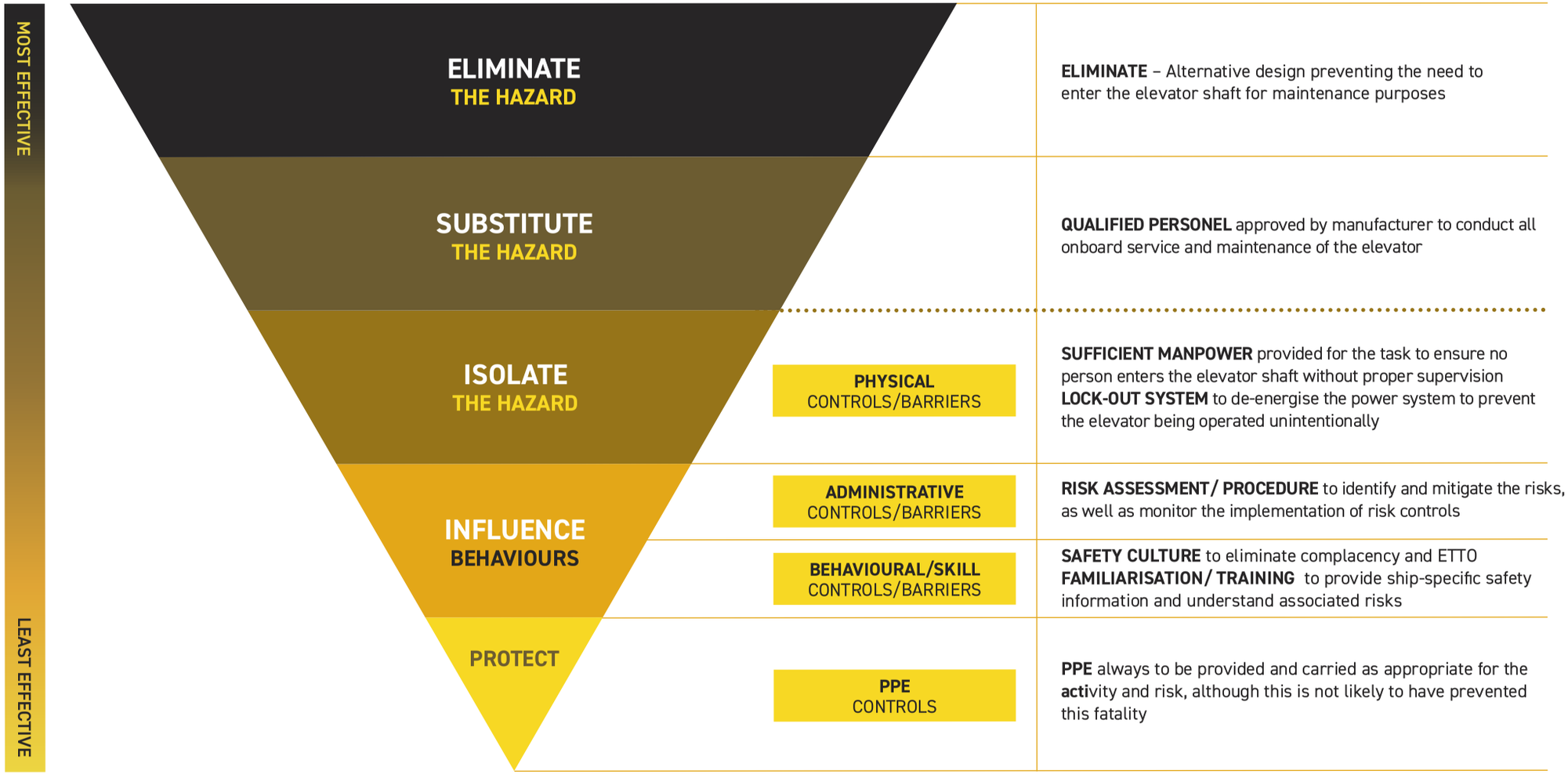
FATALITY INSIDE THE ELEVATOR SHAFT

HIERARCHY OF BARRIER CONTROLS



EXAMPLES OF POSSIBLE RISK MITIGATION CONTROL MEASURES RELATED TO THE CASE STUDY

ELIMINATE – Alternative design preventing the need to enter the elevator shaft for maintenance purposes

QUALIFIED PERSONEL approved by manufacturer to conduct all onboard service and maintenance of the elevator

SUFFICIENT MANPOWER provided for the task to ensure no person enters the elevator shaft without proper supervision
LOCK-OUT SYSTEM to de-energise the power system to prevent the elevator being operated unintentionally

RISK ASSESSMENT/ PROCEDURE to identify and mitigate the risks, as well as monitor the implementation of risk controls

SAFETY CULTURE to eliminate complacency and ETTO
FAMILIARISATION/ TRAINING to provide ship-specific safety information and understand associated risks

PPE always to be provided and carried as appropriate for the **acti**vity and risk, although this is not likely to have prevented this fatality

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.