Fatality inside the elevator shaft

Fatality inside the elevator shaft

BACKGROUND

- **During the voyage a potential problem was identified with the stopping position of the vessel's elevator car.**
- **Checks were carried out, but the problem persisted, and as a result the elevator was taken out of service until further investigation could be carried out anchorage.**
- **On the day of the incident the electrician was working inside the elevator shaft, while an electro–technical trainee (ETT) was located outside to act as a safety/communications contact point.**
- **They later stopped for dinner and the ETT watched the electrician come down through the escape hatch in the roof of the car and exit through the open elevator door on Deck B.**
- **Later the EET noticed that the electrician had not followed him. However, this did not raise any concerns as he assumed that the electrician had gone to his cabin to change for dinner.**

Top of elevator car showing maintenance box and safety cage
Source: Investigation report 06/2018 by Transport Malta – Marine Safety Investigation Unit

BACKGROUND (continued)

- **Later as the electrician had still not arrived for dinner and the ETT expressed his concerns to the C/E.**
- **They both went to look for the electrician, but when they were unable to locate him.**
- **the C/E asked the ETT to point out where he had last worked with the electrician.**
- **They proceeded to the elevator door on B deck, which was closed, and used an emergency tool to open the door.**
- **Upon opening the door, they found that the elevator car had moved downwards, and the electrician were inside the elevator shaft.**

Emergency door tool
Source: Investigation report 06/2108 by Transport Malta – Marine Safety Investigation Unit

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THE INCIDENT

- **The electrician had his right leg draped over the counterweight and his upper torso trapped between the counterweight and one of the counterweight guard beams.**
- **The electrician was wearing a safety harness and he was outside the safety cage on top of the elevator car.**
- **The C/E notified the master immediately, who raised the general alarm and then went to the bridge to inform the company.**
- **A member of the onboard medical emergency team entered the elevator shaft and confirmed that the electrician was not breathing and he could not detect a pulse.**
- **A hoisting arrangements, using wires and chain blocks, were rigged, which allowed the elevator car to be hoisted and the counterweight to move down and free the electrician. When pulled out from the elevator it was confirmed that the electrician had no pulse.**

The area where the electrician was found inside the elevator shaft
Source: Investigation report 06/2018 by Transport Malta – Marine Safety Investigation Unit

THE INCIDENT (continued)

- **The master received instructions from the agent to heave anchor and meet with a rescue vessel**
- **Five people embarked to conduct a medical examination of the deceased.**
- **The body was later taken ashore by boat and a post mortem confirmed the cause of death to be a blunt compressive trauma to the trunk.**
- **The company arranged for an authorised expert to carry out an inspection of the elevator. The inspection did not indicate any failure of the elevator's machinery in relation to this particular incident.**

REFLECTIVE LEARNING

The questions below are intended to be used to help review the incident case study either individually or in small groups:

- **What do you think could have been the immediate cause of the incident?**
- **What other factors do you think contributed to the incident?**
- **What do you think were the barriers that should have prevented this incident?**
- **Why do you think these barriers might not have been effective on this occasion?**
- **Does your SMS include a lock-out/tag-out system on board? When is it to be used?**
- **What can be done to prevent complacent safety behaviour developing on board your ship?**
- **How do you conduct familiarisation for new joiners on board your ship? What do you think are the most important aspects of good familiarisation?**

LESSONS LEARNED

The following lessons learned have been identified based on the available information in the investigation report and are not intended to apportion blame on the individuals or company involved:

- **Risk control measures**: While the onboard Safety Management system provided a risk assessment for 'Electrical Workshop Activities on Elevator Cage', this only covered the use of Personal Protective Equipment. It did not cover the risks associated with working inside the elevator shaft and there was no provision for electrical isolation or safe entry and exit of the shaft.

- **Maker's instructions:** The manufacturer's instructions state that if the elevator is not levelling at any floor, then it should be taken out of service and a technician consulted. The elevator was taken out of service but a technician was not consulted.

- **Safety barriers:** A safety cage is provided on top of the elevator car to safeguard the person(s). The electrician was found outside the safety cage, which may have exposed himself to additional danger**.**

- **Entering elevator shaft alone:** The investigation could not establish why the electrician re-entered the elevator shaft. From the position in which the electrician was found, the investigation hypothesised that he likely re-entered the elevator shaft to retrieve a plastic bottle containing oil used to top up the guide rail lubrication boxes. While trying to retrieve the bottle, it appears that he got trapped between the counterweight and the counterweight guard beam.

- **Latch-out system:** Earlier the electrician had left the elevator shaft through the emergency escape hatch of the car into the elevator cabin. This would have triggered the latch-out system and isolated the power on the system. To reactivate the elevator the emergency escape hatch would need to be closed, and then physically reset the system at the control cabinet on deck D. The position of the elevator car suggests that the electrician probably reset the latch-out and then called the elevator car to deck A, before entering the elevator shaft through the elevator door on deck B.

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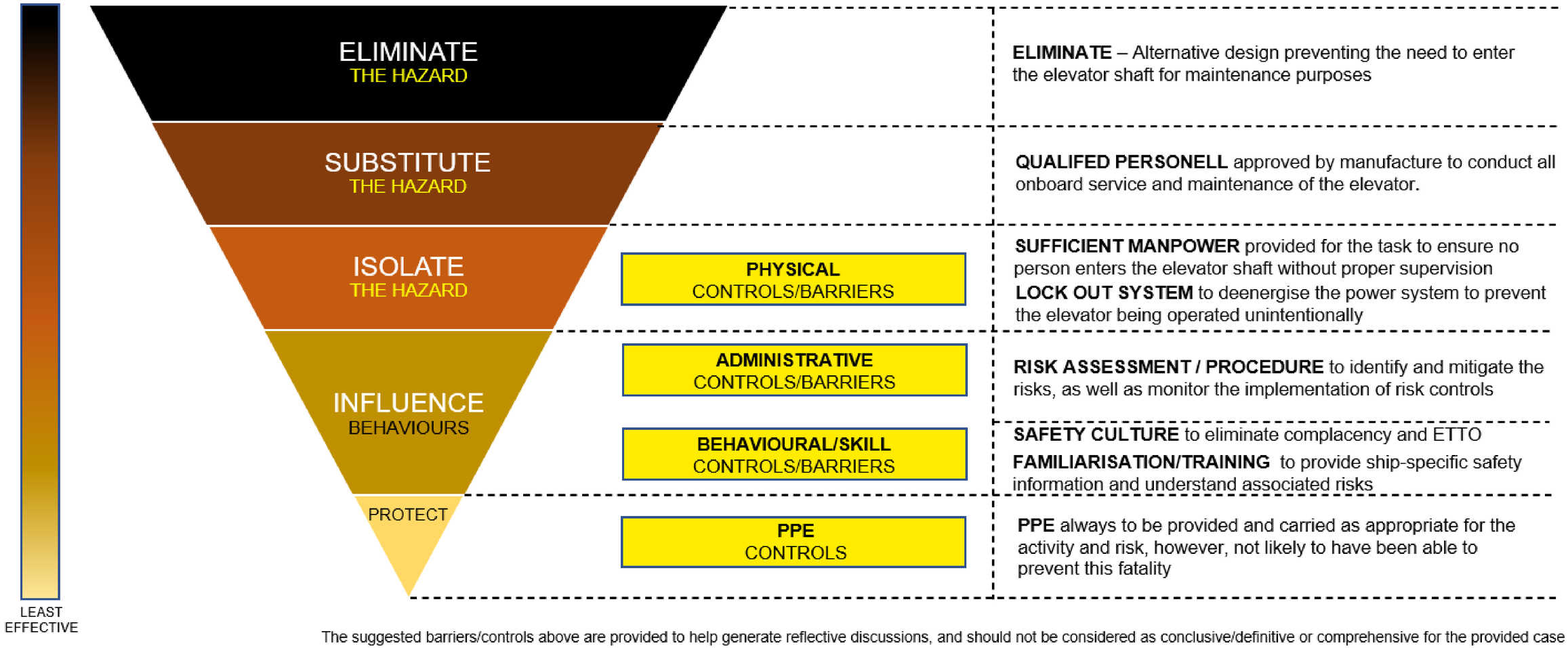
HIERARCHY OF BARRIER CONTROLS



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

QUALIFED PERSONELL approved by manufacture 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 deenergise 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 activity and risk, however, not likely to have been able to prevent 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.

CONCLUSIONS

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 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). This 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. 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.

Familiarisation and training are 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.

Furthermore, a risk assessment should cover the entire work operation, to ensure it captures the hazards associated with the various work activities necessary to complete the job.

QUESTIONS