

Case Study 10

Human Error

While based on real events, facts have been altered to facilitate learning. The case study should not therefore be taken as an accurate reflection of what actually happened.

Incident at E1 Jetty, 1 August 2005

Synopsis

At about 0540hrs on Friday 1 August 2005 Mr. X, the night shift worker at E1 jetty handed over responsibility for unloading the ship "Talava" which was then berthed at the jetty. Mr. Y assumed responsibility for unloading operations until about 0620hrs when he handed over responsibility to Mr. Z.

At around 0620hrs the E1 fuel oil Jetty-head valves on booms 4 and 5 were open, and the F80 main line valve was also open to allow F80 line cleaning.

As Mr. Y walked back to the mess room he closed the F80 main line valve and opened the F35 main line valve, thus allowing fuel oil to flow up the F35 main line to clear the line. It appears that Mr. Z was fully aware of these actions and understood their implications.

Mr. Z was left alone on E1 jetty, and closed the boom 4 jetty-head fuel oil valve as line cleaning on the F80 main line was now completed. He then continued to check the valve line-up and noticed that a boom 5 valve, which he presumed was the fuel oil valve, was shut. He opened it and continued with his duties.

However, instead of opening the boom 5 jetty-head fuel oil valve, Mr. Z had opened the boom 5 jetty-head ballast valve, thus allowing fuel oil to enter the ballast system. At interview, Mr. Z said that he had no intention of opening the ballast valve; he intended to open the fuel valve.

Line clearing continued with this erroneous valve line-up until about 0800hrs, when Mr. Z handed over responsibility for unloading to Mr. Y. Mr. Y checked the valve line-up and discovered Mr. Z's error. The boom 5 jetty-head ballast valve was closed and corrective action commenced.

2003 incidents at E1 and E2 Jetties

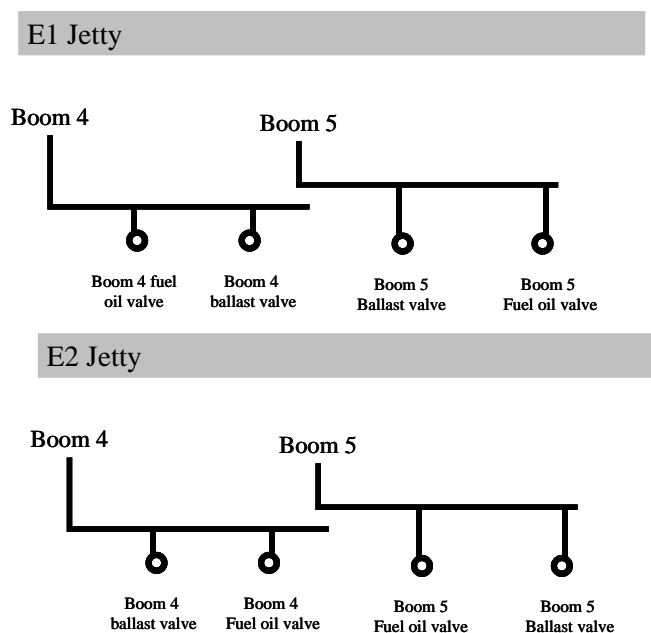
3 June 2003 incident at E1 Jetty

In this incident an operator was distracted whilst opening two jetty-head fuel oil valves. Having correctly opened the first valve, he then applied the right action (opening the second valve) to the wrong object (the jetty-head ballast valve). This had the same consequence as the 1 August 2005 incident, allowing fuel oil into the ballast system. It is understood that this incident also involved the same jetty-head booms, namely numbers 4 and 5.

14 February 2003 incident at E2 Jetty

In this incident it was determined that during loading of a vessel a jetty-head ballast valve had been left open, allowing DERV to enter the ballast system. At some time after the initial error, an unknown person had closed the ballast valve.

Boom and Valve Configuration



The fuel and ballast valves are identical and have no labels or colour-coding to indicate which is which, so it was not possible to visually distinguish between them. There was no written procedure for valve line-up for loading and un-loading vessels, or line-cleaning.

Instruction

Use the Human Error information in your manual to analyse the following unintentional behaviour by

1. Determining the error type
2. Identifying the contributing factors
3. Making recommendations to prevent further incidents.

“Mr Z opened the boom 5 jetty-head ballast valve, allowing fuel oil into the ballast system for approximately one hour and forty minutes.”

Model Answer

1. Human Error Type:

a. Skill-based error; slip of action

Mr Z was clear which valve was the fuel oil valve. Both valves were identical. Mr Z did not forget anything and therefore he did not have a lapse of memory. His plan was good but execution poor – he did not make a mistake.

2. Contributing Factors:

a. Design of equipment.

No information available to indicate which valve was which (e.g. colour, shape coding). There is some information available in terms of the position of the two valves in relation to each other, but this is unclear due to the different layout on the adjacent boom and on the other jetty. All the problems associated with inconsistent layout and lack of coding indicates poor ergonomic input during design.

3. Recommendations:

a. Distinguish valves by

- i. Colour
- ii. Shape
- iii. Consistent layout in all locations
- iv. Other suggestions to distinguish valves

b. Determine other control strategies to use short term:

- i. Briefing personnel re confusing design
- ii. Use of second operator to check line-ups
- iii. Development of a procedure

c. Preventative actions:

- i. Human factors audits of other jetties
- ii. 'forward feeding' of lessons learned
- iii. Participative ergonomics review of practices.

d. Other suggestions from delegates