

Breaking the error chain, part 1



Eric Murdoch
Chief Surveyor
+44 20 3320 8836
eric.murdoch@ctplc.com

Collisions entering or leaving a traffic separation scheme.

The human element as part of the error chain.

Introduction

Throughout many issues of Standard Safety we have discussed claims that have been caused by errors and mistakes. We have said that, had someone acted differently during the events that led up to the incident, the incident would have been avoided.

Breaking the error chain is when someone intervenes to stop a chain of events that, if allowed to continue, would ultimately result in an incident. Mistakes do occur from human error, but ships that have a sound and robust safety management system have procedures in place that, if properly followed, will prevent this mistake from escalating into a collision, injury or pollution.

Throughout a series of three bulletins we will look at human error and what could have been done to break the error chain. In this first instalment, we consider three collisions, which occurred while entering or leaving a traffic separation scheme (TSS).

Case study 1

In this first example, our member's VLCC had been anchored in the designated anchorage southeast of the eastbound traffic lane, while they awaited berthing instructions. They had arrived in the early evening after a short voyage. The master had joined the ship at the previous port and everybody was keen to enter port and load cargo.

The award winning book '*The Human Element*: a guide to human behaviour in the shipping industry' was published in 2010. In 2013 a DVD was created, using concepts from the book to create realistic scenarios. Further information, including how to order, is on The Standard Club's [website](#).



Instructions to proceed to the pilot station were received at around midnight. Anchors were heaved in and the ship navigated towards the traffic separation scheme (TSS) and pilot station. The ship entered the TSS at a shallow angle and increased to full manoeuvring speed. The bridge was manned by the master, chief officer, second officer and a lookout.

At the same time, a liftboat was westbound. It had asked port control for permission to leave the TSS early and permission was granted. This involved a sharp 90-degree turn to port and crossing the eastbound lane. It also involved crossing ahead of our ship's bow.

The liftboat altered course, whilst our ship continued on its course and speed and drove into the liftboat as it crossed our lane. Our bridge team failed to identify the approaching hazard.

The action by the liftboat was the primary cause, but a number of errors made by our bridge team had contributed to the collision.

Errors made:

- entering the TSS and immediately increasing speed to full manoeuvring;
- failure to keep a proper visual lookout;
- failure to identify an approaching target's navigation lights;
- failure to plot an approaching target on the radar;
- failure to keep a proper VHF watch

Questions should be asked about the conduct of our bridge team. If any of those present had completed a diligent navigation watch, then the approaching hazard would have been identified and avoiding action taken.

Breaking the chain

The error chain would have been broken if the watch officer had plotted the approaching target on the ship's ARPA radar and set the CPA alarm.

Case study 2

In the second incident, which occurred in almost identical circumstances, two container ships collided during a rain squall.

Our ship was westbound and entering the TSS, while the other ship was eastbound and leaving the TSS. The master on the eastbound ship decided to leave the TSS early and made a 90-degree alteration of course to port, so their ship would cross ahead of our ship. We failed to notice the manoeuvre and the other ship struck our portside at 90 degrees.

The principal cause of the collision was the action taken by the other ship, whose watch officer enacted a dangerous manoeuvre without due attention to approaching traffic. However, at any time before the collision, our watch officer could have prevented the incident.



Errors made:

- failure to keep a proper radar watch;
- failure to plot the track of an approaching target;
- failure to call the master during a period of reduced visibility;
- failure to reduce speed during a heavy rain squall;
- failure to take emergency action in good time.

Breaking the chain

The error chain would have been broken if the lookout had alerted the watch officer to the ship approaching on the port side.

Case study 3

In the final incident, our ship left port around midnight in almost perfect weather conditions. We were westbound and had to join the traffic lane between two westbound ships. This is not a difficult manoeuvre for an experienced master, but our master did not execute it correctly and almost collided with a ship in the westbound lane, then overshot the westbound lane and collided with a ship in the eastbound lane.

Errors made:

- entering the TSS at 90 degrees, rather than at a shallow angle;
- failure to use the AIS and to communicate their intention to the westbound ship;
- failure to evaluate the course and speed of the approaching ships;
- failure to work as a bridge team.

Breaking the chain

The mistakes were made by the ship's master; however, the incident could have been prevented if the watch officer had been assertive and suggested a reduction in speed while the situation was evaluated.

**Summary**

In all three incidents, had a proper visual lookout and radar watch been maintained, by any member of the bridge team, avoiding action could have been taken and a collision avoided.

This concludes our first review of how human error can lead to a chain of errors and how the chain can be interrupted to avoid an incident. In the next bulletin we will discuss two crew injuries and a fatal injury to a stevedore. In the third and last bulletin we will discuss a cargo overflow and a total loss.