LOSS PREVENTION
Briefing

NORTH
SERVICE, STRENGTH, QUALITY

LOSS PREVENTION BRIEFING FOR NORTH MEMBERS SHIPS / JULY 2015

Root Cause Analysis

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Root Cause Analysis - What is it?

Root Cause Analysis (RCA) is a method of problem solving that tries to identify the root causes of faults or problems.

A root cause can be said to be a factor that initiates a sequence of events leading to an outcome. Once a root cause is removed from a sequence of events that cause a problem, then the problem cannot recur as that sequence can no longer occur.

A causal factor, on the other hand, is a factor that affects the outcome of an event, but is not a root cause. Removing a causal factor from a sequence of faults that lead to a problem may benefit the outcome, but does not guarantee the prevention of recurrence of the problem.

A system frequently employed is to first use an applicable tool to unearth the causal factors of an incident and then use another tool to probe deeper into those causal factors to unearth the root cause (or root causes).

In the shipping industry, RCA is employed to try to identify the causes of accidents and incidents, so as to implement corrective and preventative actions that are designed to ensure the incident does not recur. A prudent ship operator will ensure that all incidents that result in injury or damage to people and/or property, or near misses that could lead to such incidents, are thoroughly investigated. Incident investigation (including the investigation of ‘near-misses’), can tell an operator much about operational practices and safety culture on board. Well conducted and documented incident investigations can:

- Uncover previously unidentified breaches in regulatory requirements.
- Assist with claims or legal proceedings.
- Provide a true snapshot of what really happened and how work is really done on board.
- Act as a learning tool fleet-wide.
- Improve risk management in the future.

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- Identify weak procedures or risk assessments

The latest version of the International Safety Management (ISM) Code, which became effective on 1st January 2015, in Section 9 'Reports and Analysis of Non-Conformities, Accidents and Hazardous Occurrences' states:

> *9.1 The safety management system should include procedures ensuring that non-conformities, accidents and hazardous situations are reported to the Company, investigated and analysed with the objective of improving safety and pollution prevention.*
>
> *9.2 The Company should establish procedures for the implementation of corrective action, including measures intended to prevent recurrence.*

The above makes incident investigation mandatory for all holders of a Document of Compliance.

Too often, however, our experience of incident investigation and resulting RCAs linked to claims has shown that ship operators think they have identified the root causes that have given rise to an incident, and then taken steps to prevent recurrence, only to find that a similar incident befalls them in the future. Obviously, this is an unnecessary waste of resources both in carrying out the RCA and in experiencing further problems.

The purpose of this LP Briefing is firstly, to give a summary of some of the most common types of causal factor identification and RCA in use in the shipping industry. Secondly, it describes how an incomplete RCA can lead an operator into a false sense of security by believing that the problem which gave rise to an incident has been solved when, in truth, it has not. Thirdly, it explains the additional factors that may lead to the resultant RCA being incomplete or flawed. Finally, some suggestions are included that may assist Members to carry out more effective RCAs.

Legal Disclosure

While RCA is clearly an important tool for learning lessons after an incident, there may be occasions when the desire to carry out RCA at an early stage has to be balanced against the potential for an RCA report to be legally discloseable in court or arbitration proceedings which arise out of an incident. Members should therefore remain alert to the fact that where incidents may result in significant liabilities it may be prudent to seek input from the Club or lawyers before initiating an RCA in order to ensure that any appropriate steps are built in to the RCA process to protect it from legal disclosure.

RCA – Methodology

There are a number of different methods used for identifying the causal factors that give rise to incidents and for subsequently performing RCA, encompassing several different philosophies and methodologies. Each type has its benefits – and its limitations. Some experts might advise that the process is complicated and that several different types of analysis should be used for each problem, or that the type of analysis tool used should be based on the type of problem that is being experienced. Members may already have their favourite techniques. Members who are not currently using RCA are encouraged to research the various methods and settle on those methods which best suits their purposes. Below are brief descriptions of some of the most common tools used for accident/incident analysis.

Events and Causal Factors Charting

A graphical description of the time and sequence of contributing events and their causes associated with an incident. The basic methodology is used extensively throughout shore and marine based industries for accident investigation and analysis, notably by Flag States. Definitions and symbols may vary, depending on the source of reference material. The version shown here, using rectangles for 'events' which are underpinned by 'causal factors', also known as 'conditions' depicted as ovals is recommended by the United States Coast Guard (USCG), who produce extensive documentation on 'Risk-Based Decision Making Guidelines' which can be accessed on-line at:

http://www.uscg.mil/hq/cg5/cg5211/risk.asp

Volume 3 of the above USCG publication, entitled 'Procedures for Assessing Risks' is particularly useful if more extensive knowledge of the various methods of RCA described in this Loss Prevention Briefing is required. Further information on events and causal factor charting may also be found in the Occupational Safety & Health Academy (OSHA) website at:

http://www.oshatrain.org/notes/2hnotes12.html

A simple depiction of the symbols used in the events and causal charting is shown below:

	Action	Condition
Fact		
Supposition		
Verb (Past Tense)	**Active: walked, called, turned on, etc.**	**Passive: was, were**

A more comprehensive description of the above:

Events

Events are depicted as rectangles in the chart and:

- Describe a single occurrence
- Have one subject and one action
- Assign a time, whenever possible
- The first event is when the situation deviated from normal
- The last event is the incident
- Other events should relate to any significant occurrences
- The events should tell a story – a shortened version of a master's call to head office describing the accident.

If any of the listed events had not happened – then neither would the accident.

Causal Factors

Causal factors are ovals on the chart and describe a series of causes that led to an event, including:

- Direct causes – what initiated the accident?
- Equipment status
- Weather
- Failed or missing controls
- Limitations of personnel involved
- Significant conditions at the time of the event (course, speed, temperatures, pressures etc., as applicable)

Events and causal factors that **may** be contributory, but are uncertain, are depicted by rectangles and ovals outlined in dotted lines.

The events and causal factors charting method is best used where a serious incident (or near miss) results from a complex sequence of occurrences. Many collisions and groundings are found to result from such a complex series of preceding events. Events and causal factors charting is an effective tool for understanding the sequence of events that lead to an accident. However, it does not necessarily ensure that the root causes have been identified, which necessitates the use of an additional tool (see 'RCA Flow Diagram' below). The use of events and causal factors charting can also be seen as 'overkill' when analysing simple incidents.

A classic example of how an events and causal factors chart may be used in accident investigation is the 'Torrey Canyon' disaster of 1967. A brief summary of the incident follows:

The 'Torrey Canyon' was loaded with 100,000 tons of crude oil bound for a terminal in Milford Haven, on the west coast of Wales. The ship was trying to catch the following evening's high tide, in order to enter port on arrival. The Scilly Islands were expected to be sighted off the starboard bow on the morning of 18th March 1967. In the event, the islands were sighted off the port bow. The master then made the decision, in order to save time, to pass between the Scilly Islands and Land's End, the south west tip of the UK mainland, rather than alter course to pass west of the Scillies, as per the original passage plan. The passage between the Scillies and Land's End is divided in two parts by the Seven Stones Reef and each of those parts has further obstructions within them. The master decided to take the western channel. He was not particularly familiar with the area, nor did he have the applicable copy of the UK Admiralty Sailing Directions – 'Channel Pilot' on board. The ship, still doing full speed, met some fishing boats in the western channel, which delayed it making a planned course alteration. When the master did order an alteration of course to the helmsman he realized, too late, that the ship was still on autopilot. The ship then grounded on Seven Stones Reef, resulting in cargo tanks being ruptured and subsequent huge pollution. See the following map for the positions of the various salient points.

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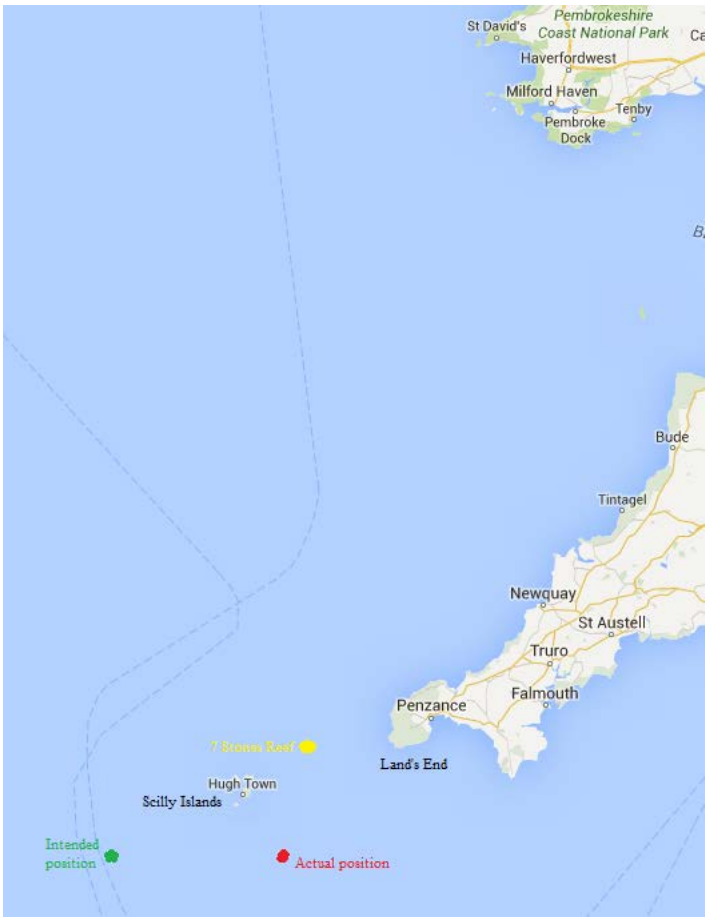
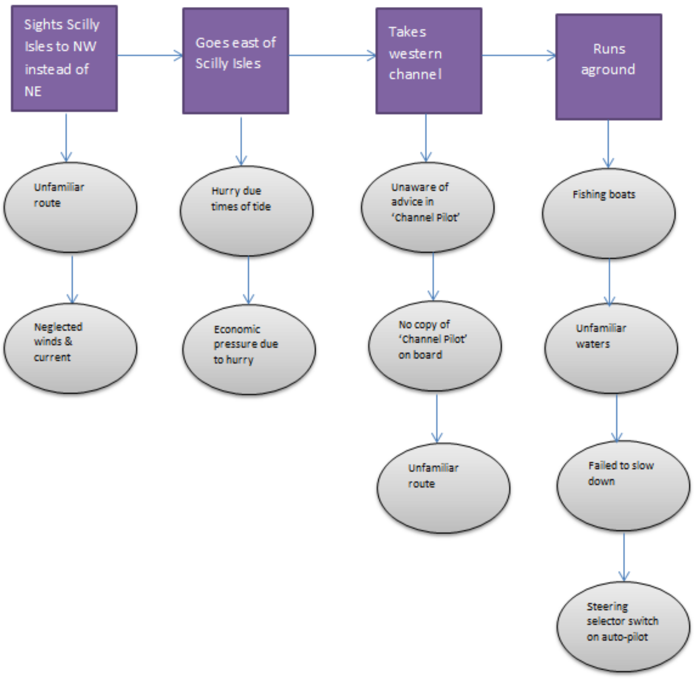
Root Cause Analysis



An events and causal factors chart of the incident might resemble that shown below (our thanks to Lloyd's Register Marine for granting us permission to use this chart):



Tree Diagrams

These are also known as Pre-defined Fault Trees, Cause-and-Effect Diagrams, Management Oversight and Risk Tree Analysis (MORT), Human Performance Evaluations Systems (HPES), Ishikawa Fishbone Diagram and several other commercial brands. The primary assertion of all the systems is that every problem has a cause that lies within a pre-defined set of categories. The fault tree is the logical model of the relationship of the top category to underlying, more basic categories. The top category of the tree is the undesired event. This leads down through the middle of the tree (intermediate events/categories) to the bottom, where lie the causal events/categories. The basic events/causal factors are reviewed and assessed to determine what the most likely root causes are. Further information on Tree Diagrams can be found in Volume 3 of the USCG publication cited previously in this Loss Prevention Briefing. The fault tree analysis tool may best be used where a serious incident (or near miss) has resulted from a straightforward sequence of events. Machinery or cargo damage may be areas where fault tree analysis is best utilised. The limitations of fault tree analysis are that it examines one specific accident of interest, i.e. it has a narrow focus. Other issues are that fault tree analysis has been described as an art, as well as a science and that analysts using this tool sometimes focus on equipment and systems, to the exclusion of human and organisational factors.

Why-Why Chart

The "Why-Why Chart" is the most simplistic RCA process and is also known as the "Five-Whys" method; so called because the process involves asking "why" at least five times or until the question can no longer be answered. An example might be:

Incident: An Oiler suffered a hand injury while lifting a heavy piece of machinery with a chain block.

1. Why: The machinery swung suddenly and caught his hand.
2. Why: The ship took unanticipated roll and oiler could not prevent the machinery swinging.
3. Why: He was working alone.
4. Why: There had been no risk assessment or tool-box talk carried out prior to the work being undertaken.
5. Why: Procedures were well documented, but ignored.

(The above example is hypothetical, but many Members may have encountered similar situations).

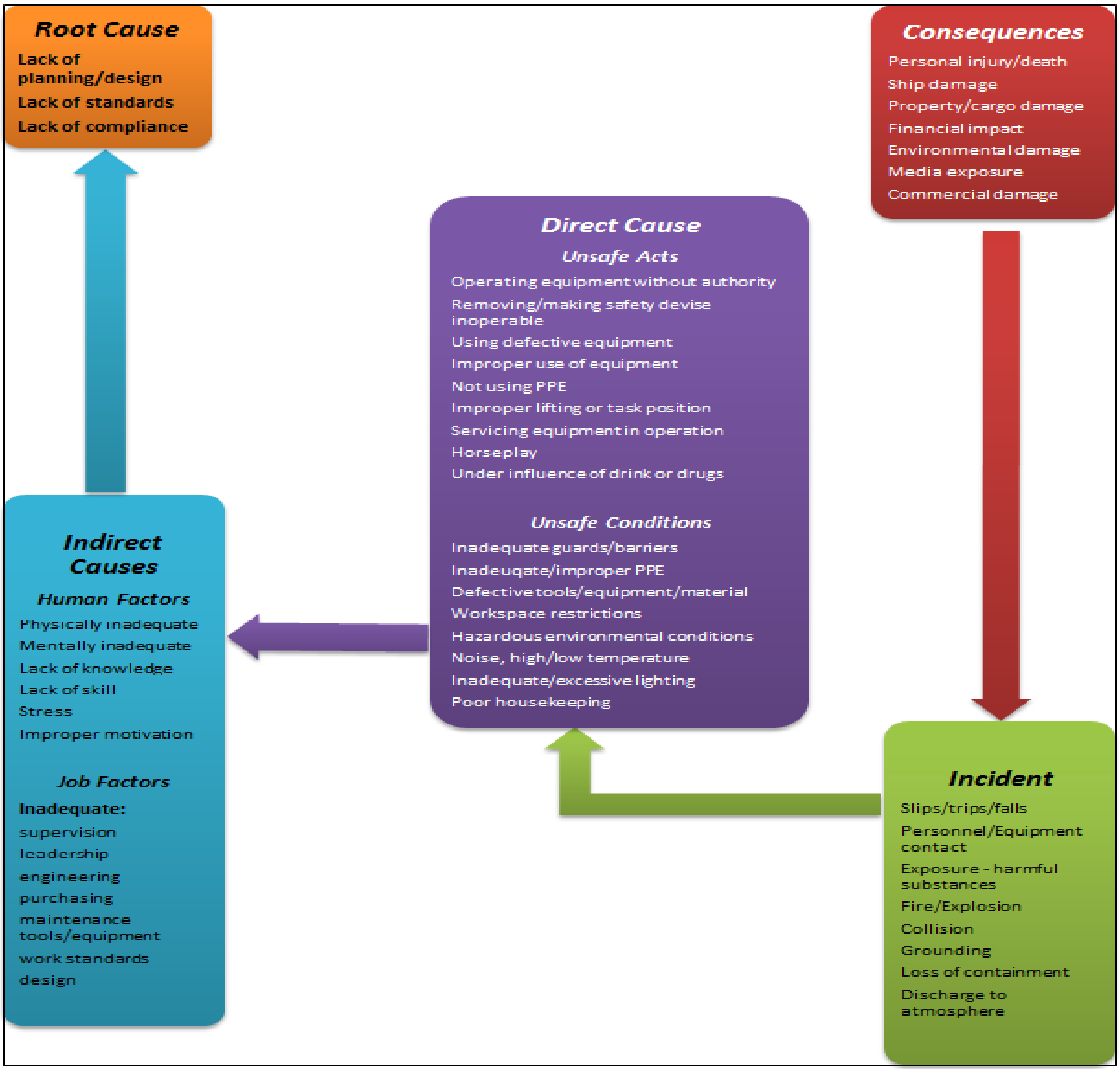
Root Cause Analysis

The theory behind the 'Five-Whys' technique is that after asking "why" five times; the root cause should be unearthed. Some commentators feel that this method may be reasonably effective for simple, non-complex accidents and incidents, but is insufficient for dealing with more complicated situations.

RCA Flow Diagram

Once the events and causal factors charting have been completed (or whatever other tool has been used in the process), the investigation team can proceed to use the information gleaned to establish the root cause(s) of the incident being analysed. There are various propriety brands of RCA tools available on the market and only one type, an RCA Flowchart is shown here. Members may wish to investigate other RCA tools and use those, if they feel that they are more appropriate. The flow diagram is a stepped process for drilling down through the incident causation chain to determine the true causes of an accident.

The flowchart below is adapted from that used by Lloyds Register Marine and we thank them for their kind permission to use it here:



Root Cause Analysis

RCA of an Incident

The incident described here is an approximation of an actual incident. The names of the ships, the geographical location, and the identities of the people and organisations involved have been changed for reasons of confidentiality. The internal incident investigation conducted by the Owners' of one of the ships, 'Magpie' is fabricated. The depiction of the external investigation, conducted by Flag State, is an abridged and amended version of the actual investigation.

(A more comprehensive description of the investigations conducted by the Owners of 'Magpie' and Flag State are included in the Appendix to this LP Briefing).

The Incident

On a fine and clear summer's morning the 70,000 DWT container-ship 'Magpie' collided with the 10,000 DWT general cargo ship 'Black Cat' in the North Sea. There were no injuries or pollution and only the smaller ship suffered any significant damage. Each vessel was able to continue passage.

As the ships approached, the Officer-of-the-watch (OOW) of 'Black Cat' assessed (wrongly, as it turned out) that 'Magpie' was overtaking his vessel. Action to avoid collision, by both vessels, was then delayed by VHF discussions between the OOWs of both ships. Further delay resulted when the OOW on 'Magpie', who considered the event to be a crossing situation and that 'Magpie' was the 'stand-on' vessel, requested 'Black Cat' to keep clear by using the free text facility on the Automatic Identification System (AIS).

Both ships eventually took avoiding action, but too late to avoid a collision. The 'Black Cat' suffered damage in way of the accommodation block on the starboard side. 'Magpie' escaped with only minor damage on her port bow.

Internal Investigation Summary

The internal investigation conducted by the Owners of 'Magpie' can be summarised as follows:

- It was completed in one day.
- It was conducted by one man.
- The main cause of the incident was identified as the other ship's ('Black Cat') contravention of the Collision Regulations.
- The secondary cause was that 'Magpie' failed to take timely avoiding action because her OOW's judgment was impaired and fatigue may have been a contributory factor.

External Investigation Summary

The external investigation conducted by representatives from the Flag States of both vessels involved can be summarised as follows:

- It took several weeks to complete.
- It was conducted by a team of investigators who collaborated closely throughout.
- The incident was caused by several immediate and several underlying factors, not all of which originated on board the ships; some of the root causes could be traced back to shore management.

Why RCAs are So Often Flawed

The DPA's internal investigation of the incident described above was incomplete and missed many of the salient points. Regrettably, this is something that we see all too often when we review reports into incidents of a similar nature.

Incident investigations are often faulty because the following factors impact upon the team's conduct of the investigation:

Time	• Report completed within unrealistic timescale.
Ability	• Limited understanding of the process.
Prejudice	• Pre-conceived idea of the cause. • Adapt evidence to suit.
Pain	• Results not what management wants to hear.
Impact	• Impact on the organisation's goals not considered.
Focus	• Concentrates on analysis, rather than eliminating the problem(s).
Blame	• Focussed on **who** caused problem. • Not **how** the problem arose.

RCAs – Ensuring Effectiveness

In this final section we shall provide some information on how Members can:

- Evaluate and implement a system of RCA and incident investigation.
- Ensure RCA is effective in their organisations.
- Obtain the benefits from having a robust system of incident investigation and RCA embedded within their SMS.

System Implementation

Staff within Members' organisations who are tasked with incident investigation (DPA etc.) should be actively involved in the evaluation of different methodologies and they should ensure that they are comfortable with, and have faith in, whatever systems are chosen.

The chosen systems of incident investigation and RCA need to be documented by being incorporated into the appropriate section of the Safety Management System (SMS).

All staff who may be involved with incident investigation should have suitable training. This will have an impact on the actual choice of systems:

- There should be suitable, cost effective, training courses available.
- The systems should not be so complicated that protracted training courses need to be undertaken before staff becomes proficient in their use.

Training should not be restricted to DPA and associated shore-staff. Sea-staff, particularly senior officers and safety officers, will also benefit from being trained in incident investigation.

The investigation team should be free to perform investigations and make recommendations without constraints. This is critical in delivering an effective RCA. Staff members who are under investigation and senior management should not hamper the investigation process in any way.

Senior management does, however, need to review and agree to any recommendations for corrective and preventative actions that are made by the investigation team, prior to implementation.

Most importantly, any corrective and preventative measures that are implemented need to be continuously monitored, to ensure that they are having the desired effect.

The table below provides a summary of the main steps in the development and implementation of an effective system of incident investigation.

Implementation Summary:

Seek	• Explore various RCA & investigation methodologies.
Choose	• Choose suitable methodologies. • Staff need to be comfortable with choice.
Create	• Procedures developed • Incorporated in SMS.
Train	• Staff trained in incident investigation/RCA.
Free	• Investigations to be free of artificial constraints.
Agree	• Recommendations agreed by management.
Evaluate	• Corrective actions monitored to ensure effectiveness.

Effective RCA

To be able to gain maximum benefit from performing a root cause analysis of any incident, we must be aware that the resultant root causes have to be:

- Underlying.
- Reasonably identifiable.
- Controllable by management. (For example, in a case where containers were lost overboard, 'bad weather' was identified as a root cause. Management has no control over the weather and hence is unable to implement any corrective or preventative actions that can control the weather).
- Allow for the generation of solutions.

The process of RCA can be summarised as follows:

1. Define the problem
2. Collect relevant data
3. Identify the root causes
4. Implement corrective actions
5. Evaluate and follow-up

There is frequently more than one root cause for a single problem. The determination of those causes requires persistence and effort. In this respect, 'a problem shared is a problem halved' – team effort is required. In the case we illustrated above, the fictitious DPA conducted the investigation and follow-up report alone and within artificial restraints imposed by management, which affected the outcome in a negative way. RCA needs to be performed systematically by a dedicated team, as part of the investigation process, with documented evidence to back-up the conclusions and identified root causes.

The investigating team needs to be aware of and understand the organisation's goals; this will help them to define the problem and to implement appropriate resolutions.

Workable corrective and preventative actions can only be determined after it has been firmly established why an incident occurred and RCA helps to identify what, how and why the incident happened. After the root causes have been determined, any corrective actions initiated to prevent recurrence of the problem(s) need to be individually evaluated:

"If this corrective action had been implemented before the incident, would it have prevented, or reduced the chances of the incident occurring in the first place?"

"Will this corrective action be reasonably certain to prevent recurrence?"

"Is this corrective action within the Company's control, and does it meet the Company's goals and objectives?"

"Is it possible that this corrective action could inadvertently trigger new and currently unforeseen problems?"

Once the above questions have been answered satisfactorily, the corrective actions should be implemented. As stated previously: the effectiveness of the corrective actions needs to be monitored.

RCA Benefits:

Culture
- Transform Company Culture
- From 'reactive' - deals with problems after they happen.
- To 'proactive' - solves problems before they occur.

Comfort
- RCA reduces the frequency of problems
- Allows staff to get on with better things
- Allows management to sleep soundly

Cash
- Implementers of 'Best practice'
- Attract top-level customers
- Boost profits

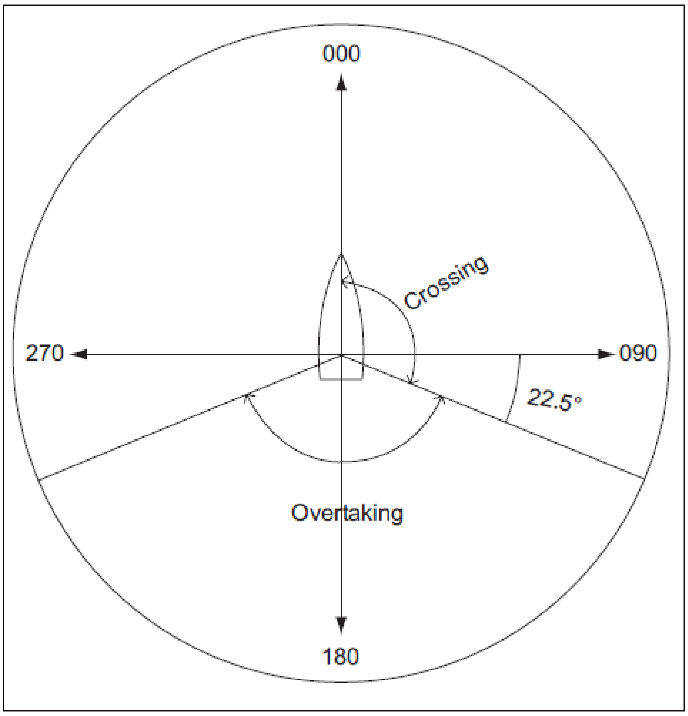
Appendix – RCA of an Incident

(I) Internal Investigation

The initial, internal, incident investigation was carried out by Jan Charver, Designated-Person-shore (DPA) and Safety Manager of the Box Direct Shipping Company, the owners and operators of the 'Magpie'. Mr. Charver attended on board at the next port, where 'Magpie' arrived later the same day that the incident occurred. Mr Charver conducted, what he considered to be, a thorough investigation of the incident; the contemporaneous evidence was reviewed (including the downloaded VDR data covering the time of the incident); all the crew involved in the incident on 'Magpie' were interviewed and he reviewed all that the ship's staff had done in the aftermath of the incident. At the conclusion of this process, Mr Charver was firmly of the opinion that 'Black Cat' had indeed been the 'give way' vessel and that the OOW on 'Magpie' could only be criticised for not taking early enough action to avoid the collision. He also concluded, after reviewing the Hours-of-Rest record, that the OOW had worked some 2 hours more than allowed under the IMO/ILO guidelines during the 24 hours leading up to the incident. Mr Charver concluded that fatigue was therefore a causative factor.

On his return to the managing office the next day, Mr Charver had an initial meeting with Mark Ashby, the Managing Director of Box Direct Shipping, to discuss the incident and Mr Charver's investigation. Mr. Ashby emphasised that it was necessary to conclude the investigation as soon as possible, because customers were already calling him to voice their concerns and were threatening to "take their business elsewhere" if prompt actions were not taken to avoid a recurrence. Mr Ashby also emphasised that, because of the financial restraints under which the Company was currently operating, any corrective and preventative actions recommended as a result of the investigation should be "cost effective".

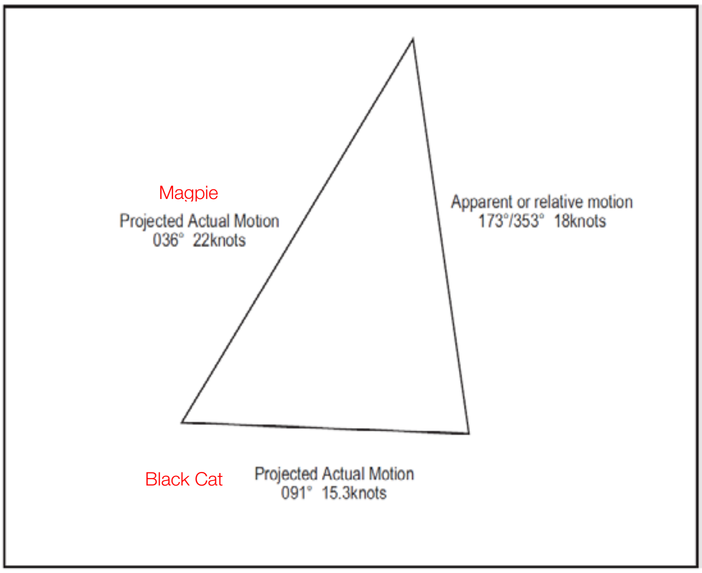
With Mr. Ashby's comments at the forefront of his mind, Mr Charver proceeded to write up his initial report on the incident, to perform a RCA, and to recommend the implementation of measures that would seek to avoid recurrence. Mr Charver based his assumption, that 'Magpie' had been the stand-on vessel, on Rules 13 and 15 of the International Regulations for Preventing Collisions at Sea (Colregs), which is represented in the below figure.



Representation of Rules 13 and 15 (COLREGS)

The Colregs state that a vessel shall be deemed to be overtaking when approaching another vessel from a direction more than 22.5° abaft her beam. Otherwise, the two vessels shall be crossing.

From the information Mr Charver had obtained during his visit on board 'Magpie' he constructed a plot to find the relative motion of the vessels involved, as shown below.



Plot to find relative motion

Mr Charver's deduction was that the true bearing of 'Magpie' as observed from 'Black Cat' was 173°. To have been an overtaking vessel, 'Magpie' needed to be approaching 'Black Cat' at an angle greater than 91°+112.5°

(or greater than 203.5°). Mr Charver therefore deduced, correctly, that 'Magpie' and 'Black Cat' were in a crossing situation and that 'Black Cat' had the obligation to take action to avoid collision, as provided under Rule 15 of the Colregs:

"When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel".

Mr Charver then proceeded to construct a RCA, using the 'Five-Whys' technique, with which he was familiar:

Incident: Company vessel 'Magpie' collided with another vessel, 'Black Cat' in the open sea in good weather and with good visibility.

1. Why: The 'Black Cat' was in contravention of Rule 15 of the Colregs.
2. Why: OOW on 'Black Cat' had wrongly assumed that 'Magpie' was an overtaking vessel and that it was therefore 'Magpie' that had a duty to keep clear.
3. Why: Despite VHF and AIS communications between the 2 vessels, action taken to avoid collision was delayed until it was too late.
4. Why: OOW on 'Magpie' made an error of judgment in not taking avoiding action sooner.
5. Why: OOW on 'Magpie' was fatigued and therefore his decision making process was temporarily impaired.

For some time prior to the collision, Mr. Charver had been trying to initiate comprehensive and regular reviews of bridge watch-keeping and navigational practices across the Box Direct Fleet. Progress towards this goal had been hampered by the fact that, apart from himself, Box Direct did not employ any shore-staff who had served as senior deck officers at sea. All of Box Direct's superintendents were technical superintendents and engineers by profession; and they were the only members of shore-staff that regularly visited the ships. Mr. Charver felt that the 'Magpie'/'Black Cat' collision presented an ideal opportunity to suggest to senior management that they should be employing marine superintendents with extensive experience as senior deck officers on the types of ships and trades in which the Box Direct Fleet was engaged. Mr. Charver was, however, also conscious of Mr. Ashby's words to him: that any measures taken to avoid recurrence should be "cost-effective". Mr. Charver interpreted those comments to mean that Mr. Ashby would not countenance any additional expenditure on corrective and preventative measures arising from the investigation. Mr. Charver also had a performance goal which stated: "Department expenditure to be within budget for current year and next year's budget to be 5% less than current year". Mr. Charver's annual salary bonus was dependent upon him achieving this goal. Mr. Charver therefore decided to omit any suggestions for employment of additional staff from his report. In the end, he decided to make two recommendations:

1. Closer monitoring of hours-of-work and hours-of-rest by ship's Master.
2. The OOW to be relieved as soon as possible and to attend a Bridge Team Management refresher course.

Mr. Charver felt that these two recommendations would hopefully satisfy the demands of both Mr. Ashby and his customers.

(2) - External Investigation

In accordance with the International Maritime Organisation's (IMO's) 'Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident' the flag states of both vessels conducted a joint investigation into the collision. The final report runs to almost 40 pages, so only the points relevant to this LP Briefing are documented here.

Flag State Investigation & Findings

1. The failure of both OOWs to take early action to avoid collision was the cause of the accident. The OOWs of both ships had worked hours in excess of those prescribed under STCW. Fatigue is therefore considered to have made some contribution to their poor decision making.
2. 'Black Cat' was the give-way vessel. No single clear cause was found to explain why the OOW on 'Black Cat' considered that 'Magpie' was an over-taking vessel.
3. 'Magpie', although she was stand-on vessel, still had the opportunity to take action in good time. The OOW on 'Magpie' wasted time in sending AIS text message and in VHF discussions. AIS equipment is not intended to be used as a means of communication via manual input of text messages, and particularly should not be relied upon as a method of collision avoidance.
4. Neither OOW called the master before the collision, despite the standing instructions given by the masters of both vessels, guidance given during the formal training of navigating officers and STCW requirements.
5. The 'Magpie' did make a sound signal before the collision, to alert the 'Black Cat' of the impending situation. The OOW of 'Magpie' used the forward

whistle to make the signal, so that no-one in the accommodation block of ‘Magpie’ heard the whistle. No-one on board ‘Magpie’ was therefore alerted to the risk of collision, not even the master. ‘Black Cat’ did not make any sound signal, and could therefore have been considered to be in breach of the relevant section of Rule 34 of the Colregs:

(d) When vessels in sight of one another are approaching each other and from any cause either vessel either fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle.

6. The investigation revealed that the OOW on ‘Magpie’ and the other navigating officers on board had an uncertain understanding in the operation of the engine controls and consequently did not consider speed reduction as an option for dealing with collision avoidance, or for actions taken post-collision. The Flag State investigation uncovered that all of these officers had signed a fleet circular, which specifically stated that they had full authority to reduce speed whenever necessary. The fleet circular was written in a way that was not easily interpreted by a multi-national crew who did not have English as a first language. Consequently, the navigating officers had signed the fleet circular, without having a clear understanding of the contents.
7. The ‘Magpie’ failed to activate the vessel’s general alarm after the collision. This might be related to a lack of clarity in the vessel’s emergency procedures. The ‘Magpie’ emergency procedures manual included a list of actions to be taken in the event of collision, the first of which was: ‘General Emergency Initial Actions completed?’ The procedures did not clarify what these ‘initial actions’ should be, or who should carry them out. ‘Black Cat’ did sound the general alarm, but then resumed passage less than half-an-hour after the collision - during which period it is unlikely that all of the necessary checks could have been performed to ascertain that it was safe to resume passage.
8. The watch-keepers on ‘Magpie’ at the time of the incident, the OOW and an AB who was acting as lookout had no common language. The only way they could communicate was by sign-language. The OOW stated, in his interview with Flag State, that in the moments leading up to the collision he had initiated hand-steering and ordered the AB to take the wheel. The language difficulties had perhaps wasted precious seconds in completing the transfer from auto-pilot to hand steering.
9. Box Direct Shipping, the Owners and Operators of ‘Magpie’ had a policy that only technical superintendents visited the ships, all of whom had an engineering background. There was therefore no clear over-sight by shore management of bridge watch-keeping and navigational practices on board.