

Largest United Kingdom
Merchant Shipping Loss: Motor Vessel Derbyshire

By

John Jubb, B.Sc., C.Eng., MIStructE, FWeldI.

Honorary Technical Adviser and Manager to
The Derbyshire Family Association, 1985 – 2000

Abstract

The massive bulk carrier, Derbyshire, slid beneath the waves in a typhoon in September 1980 taking the crew of 42 and 2 wives with it. This paper aims to report the more interesting aspects of a 25 year saga including 2 Formal Inquiries, the finding of the wreckage which was recorded with 37,000 photographs, the reasons for the loss, the resulting research and its application to the safety of bulk carriers and the final report to be published in 2005.

Introduction

It is difficult to make a connection between the discovery of the Titanic some two miles down in the Atlantic by Dr Ballard and his team from Woods Hole in the United States and trunk calls from a hot telephone call box in Hampshire in mid-summer some ten years ago.

Dr Ballard said that the dependants of the Motor Vessel Derbyshire would be unlikely to find the wreck of the Derbyshire some two and a half miles down in the Pacific, yet the key steps in the exploratory process to search for the Derbyshire were organised in a series of long trunk calls from a call box (prior to the introduction of mobile phones).

The Motor Vessel Derbyshire went down in a Typhoon Orchid 500 miles south of Japan in September 1980 some four years after the vessel was launched into the Tees in 1976 from a shipyard owned by Swan Hunter. The United Kingdom crew of 42 seamen and 2 wives perished with the vessel which was sufficiently large to carry the 800 feet high Canary Wharf Tower laid on its deck with some hundred feet to spare at either end. Everything was British: the build from Swan Hunter, owned at the time of the loss by the Bibby Line, certified as A1 by Lloyds Register of Shipping and manned by an all British crew.

The vessel disappeared with no final SOS messages and the subsequent aerial searches about a week later revealed no wreckage and only some oil slicks in the suspected area of the loss. The latter were initially attributed to other possible shipping losses going back to the Second World War.

The first Formal Inquiry

Without any visible signs of wreckage efforts to call for a Formal Inquiry by the United Kingdom Government fell on deaf ears. Between 1980 the year of the loss and 1987, a marine surveyor, Peter Ridyard, living in Chandlers Ford, Hampshire who lost his son on the Derbyshire, found that all the five sister ships of the Derbyshire coming from the same yard on the Tees had a substantial amount of cracking in the deck plating immediately forward of the superstructure. The Derbyshire was similar in general shape to a large oil tanker with the superstructure containing the accommodation and bridge at the stern and with the cargo forward of the bridge rather akin to a massive barge. Whereas the tanker would have closed containment of the oil cargo, the bulk carrier had massive holds or steel boxes for the cargo with large opening hatches for cargo handling through the deck: the hatches were secured for the voyages to keep the vessel watertight.

The Government eventually relented and called for a Formal Inquiry into the loss of the Derbyshire in 1987 despite the lack of any knowledge of the location of the wreckage. The hypothesis of cracking in all the sister ships was insufficient to persuade the Wreck Commissioner in charge of the Formal Inquiry and his assessors that this location and type of cracking caused the loss of the Derbyshire. A further hypothesis that the cargo of iron was sufficiently damp to be liquefied and cause the vessel to roll over was also rejected. The Wreck Commissioner indicated that Derbyshire was caught in a complex typhoon called Orchid and foundered: in some respects his surmise based on little evidence at the time had more than an element of truth.

There was general dissatisfaction with the outcome. The dependants were particularly angry with the planning prior to the Inquiry and the attitude of some of the people involved in the Inquiry. Morale of both the dependants and their honorary advisory team was low with the publication of the Formal Inquiry report in 1989.

To advance their cause the dependants realised in the early nineties that the wreck of the Derbyshire had to be found in some way or another. A small group of honorary advisers worked on an informal basis to advance the investigations. Possibly the most important foundation was laid by Captain Ramwell who spent all his time ashore and his free time afloat writing letters on behalf of the Derbyshire Family Association to interested parties and in addition to Members of the House of Commons and the House of Lords. The latter led to the eventual formation of the All Party Group for the Derbyshire numbering over 100 MPs and Lords. The size of the All Party Group and the total commitment of some of its members gave the Derbyshire dependants a massive lever to move obdurate civil servants by raising questions on the floor of the Commons and the Lords. Its efficient secretary, Maria Eagle, and Rosie Winterton later became Junior Ministers in the Government.

To interest and mobilise such a large and influential Group reflects much credit on Captain Ramwell who gave several man years to achieve this outcome.

The Chairman of the Derbyshire Family Association, Paul Lambert, who lost his brother when the Derbyshire sank, kept the dependants united and obtained their agreement at every stage of the investigation. He was the public face of the dependants dealing with the press, radio and television. The unity of the dependants is vital when dealing with the politicians and the civil service.

The search for the Derbyshire

A further member of the group was in Brixton and subsequently High Point prisons on another matter! During this time he studied the charts of the seabed terrain in the area where the Derbyshire was thought to be lost based on the oil upwellings seen at the time of the search for wreckage. Fortunately the prison authorities allowed him the necessary equipment including a formidable pair of dividers. When released we followed up his ideas with Southampton oceanographers, master mariners and marine geologists to the time when we felt confident that we knew the approximate location of the wreck of the Derbyshire some 2½ miles down on the seabed.

Where to find the technology and money for the search? The technology is fundamentally simple. The sonar equipment with an umbilical over a pulley on the towing vessel is lowered near the seabed and has sufficient power to transmit beams 2½ miles on either side looking for metallic wreckage or the cargo of iron ore which will reflect the signal back to the transmitter. A rectangular area is selected for the search with the sonar equipment placed for a 75% overlap, when it has been turned round. At a depth of 2½ miles it takes at least 8 hours to effect the turn round.

An offer came from a United Kingdom organisation with a price of some £360,000 for eight days work on the chosen rectangle. Due to unknown political pressure this offer was withdrawn within a week. We were keen to use Dr Segalavitch, a distinguished Russian underwater explorer and contractor who has two titanium spheres for deepwater work with viewing windows, and a marine geologist who had worked with Dr Segalavitch exploring the bed of the Pacific Ocean looking for manganese nodules which could be mined.

Dr Segalavitch came to London, but the International Transport Federation who were funding the exploration were not prepared to use the Russians and turned to an underwater contractor from the United States. This cost approximately another £100,000 working to my exploration specification.

At this stage, the International Transport Federation, ITF, took over the search without further reference to the Derbyshire Family Association and its advisers. Some seven months later, the ITF, a representative of Channel 4 News and the United States contractor were on the site which we had identified. As soon as the sonar equipment was lowered towards the seabed, numerous reflections were identified. It was understood that these reflections were attributed to igneous intrusions in the seabed.

Five days into the eight day search, no trace of the wreckage had been found based on our hypothesis. A representative of Channel 4 News telephoned me for my opinion relating to the remaining three days of the search. Shocked by this sudden request after a lapse of seven months, I concluded that the original strategy should continue and, if the wreck was not found, at least the local search would be thorough.

What I was not told was that the umbilical holding up the sonar equipment had fractured somewhere along its length and the sonar equipment had sunk to the seabed. The contractor could not afford to lose the sonar equipment, so he lowered the photographic and video package, which we could not afford. Immediately he saw that there were no igneous intrusions on the seabed, but the wreckage of the Derbyshire subsequently found to be in some 2,000 pieces.

Our planning had been based on the loss of the Titanic whose wreck was in a handful of pieces. The hull had been ripped open by the ice over a great length, so that seawater had penetrated the interior and flowed freely into many parts of the vessel expelling most of the air. In contrast the Derbyshire had large volumes of air trapped in the holds and as the vessel sank, the external pressure increased with depth, so that an implosion was followed by an explosion which blew the vessel to pieces. In a crude way the system can be replicated by squeezing a balloon until it blows apart: it will be much more dramatic for large volumes of highly strained steel. The largest piece of the wreckage spared the explosion was the bow which had largely flooded with seawater prior to the sinking of the vessel. The bow had tilted and ploughed into the seabed, but the camera revealed the SHIRE of DERBYSHIRE painted on the bow.

Eureka! Finding the vessel was a massive step forward, but there was a sad side to this achievement. The excitement precipitated a heart attack for one of the dependants and he died.

Assessment of the search findings

Lord Donaldson of Lynton was charged by the Government to study the findings from the wreck and to see whether further study of the wreckage should be carried out to enhance the future safety of bulk carriers. He concluded that the wreckage should be examined forensically and that some £2 million would include a detailed survey of the wreckage field. His recommendations were accepted and 37,000 photographs of the wreckage were recorded.

The whole of the wreckage field 2½ miles down was photographed on an overlapping process with the wreckage spread over twice the length of the ship on the sea floor. Apart from the bow it was mangled and distorted by the explosion following the implosion caused by the increased pressure of seawater as the vessel sank.

Why did the Derbyshire sink? Apparently the green seas crashing on the bow deck during the typhoon had washed away several of the bow space ventilators leaving holes the size of a lavatory seat through which 100 tonnes of seawater per hour could enter the bow space. The bow space was filling up and the bow was tilted down by the weight of water.

At the same time one of the 20 tonne winches broke away from the bow deck and was damaging more deck furniture as it careered around the deck. The coaming of the booby hatch was severely dented and the cover broken away.

This allowed more seawater into the bow through an opening of roughly one square metre. The bow was dipping deeper into the sea. On the bridge at the stern of the vessel, it would be very difficult to see what was happening at the bow during the typhoon some thousand feet away or to detect the change of trim due to the flooding of the bow. The only way from the stern to the bow was along the deck: this was impractical during bad weather.

As the bow went down, the green seas crashed with more ferocity on the hatch covers which broke over No. 1 and No. 2 holds: the latter filled with seawater. The Derbyshire was doomed. She was no longer seaworthy and slid like a submarine under the waves taking her crew with her.

No SOS message was received despite three possible methods of communication. This massive ship and her cargo of 150,000 tonnes of iron ore sank until it imploded and exploded within 50 metres of the surface. The metal remnants settled quickly on the seabed and were showered subsequently by the fine iron ore akin to snow giving a light covering over rough ground. It was 1980 when the Derbyshire sank and it was 1994 before the video cameras revealed the 2000 pieces of wreckage mangled and bent on the seabed. There were 37,000 pictures of the crumpled and torn steel spread over twice the length of the ship some 2½ miles down. It took over three months sitting in front of a TV screen to identify where each piece of the three dimensional jigsaw fitted into the original structure of the ship. It proved to be a visual and intellectual challenge which left the observer with physical and mental damage.

The Second Formal Inquiry

John Prescott whilst in opposition promised a Re-opened (Second) Formal Inquiry. He kept his promise about the Re-opened Inquiry when the interpretation of the 37,000 photographs of the wreckage and further expert evidence led to doubts about the strength of deck furniture on the bow in green seas, the strength of the large hatch covers and the position of the load line traditionally called the Plimsoll line.

These doubts have been addressed by the International Association of Classification Societies and the International Maritime Organisation which is the only United Nations Agency located in the United Kingdom. New build ships in the bulk carrier class are being designed to more onerous criteria to minimise the risks which have been highlighted by the loss of the Derbyshire and the subsequent forensic investigations. The bulk carrier as the former Cinderella of the shipping industry has attracted rigorous ongoing investigations.

The outcome for the 44 families was enhanced by the hope that stronger bulk carriers in the future, not the existing stock, would avoid death due to the bulk carrier failing structurally and drowning the crew. Some dependants hoped for better compensation for the loss of a loved one, some £3,500 in 1980, but identifying a specific guilty party in a complex failure was always going to be an impossible task.

Concluding remarks

It took from 1980 to 2000 to bring the Derbyshire saga to a successful conclusion backed by some 20 man years of free expertise, private money and an All Party Derbyshire Committee of over 100 Members of Parliament and Members of the House of Lords. Without the All Party Committee it would not have been possible to provide leverage on a Civil Service which dominates the background to all Formal Inquiries.

Further Reading or Study

Two Formal Inquiries were carried out for the United Kingdom Government into the loss of the M.V. Derbyshire:-

M.V. Derbyshire, Report of Court No. 8075, Formal Investigation London, HMSO 1989.

Report of the Re-opened Formal Investigation into the loss of the Derbyshire: HMSO 2000. ISBN 0 11 702530 5

Following the discovery of the wreck of the Derbyshire in 1994 a Report was prepared by Lord Donaldson of Lynton to assess what further work should be undertaken to identify the cause of the sinking of the Derbyshire.

Lord Donaldson's Assessment (Derbyshire), Cm 3128, London: HMSO 1995.

Prior to the Re-opened Formal Inquiry there was a colloquium:-

M.V. Derbyshire: The Search, Assessment and Survey, RINA, London 1996.

Reference should be made to the following organisations for the varied and extensive list of publications which have arisen following further investigations and current research into the behaviour of bulk carriers prompted by the findings of the loss of the Derbyshire:-

Royal Institution of Naval Architects, London

International Association of Classification Societies, Headquarters, London.

International Maritime Organisation, part of the United Nations with its office in London.

Marine Coastguard Agency, Southampton.

The MCA aim is to present a final report on the numerous investigations resulting from the finding of the wreckage of the Derbyshire to the dependants, the Derbyshire Family Association in June 2005. This will conclude the 25 year saga since the loss of the vessel in 1980 and will include the resulting current steps to improve bulk carrier safety.