

IN HINDSIGHT

A compendium of Business Continuity case studies

Edited by Robert A Clark



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Business Continuity
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IT Governance Publishing

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This book is dedicated to my brother-in-law,
Tom Feeney – an inspiration to us all

EXTRACT

ABOUT THE EDITOR

A Member of the Business Continuity Institute and an Approved BCI Instructor, Robert Clark is also a Fellow of the British Computer Society and a Member of the Security Institute. In 1973 he joined IBM as a computer operator. Big Blue was one of those forward thinking organisations that practised business continuity management (BCM) before the expression had even been coined; but back in the 1970s, with the exception of periodical fire evacuation drills, BCM was simply referred to as disaster recovery and was entirely focused on protecting the IT environment along with the associated electronic data.

It was less than twelve months into his 15 year IBM career that Robert first became exposed to BCM. Both local and overseas disaster fall-back trials were regular features in the IBM calendar and often involved testing its recovery capability by transferring UK operations to Germany or the Netherlands. During his time with the corporation, the closest the operation came to a real disaster fall-back was in 1974 during the UK miners' strike when power interruptions became commonplace.

His 15 years with IBM were followed by a variety of positions, including 11 years with Fujitsu Services (formerly ICL) working with clients on BCM related assignments. In 2005 he was tasked with validating Fujitsu's own BCM state of readiness across Europe. He has managed and delivered BCM solutions in the public sector, for large corporations, SMEs and central governments, gaining experience in several industries

About The Editor

including banking, insurance, oil and gas, airline, manufacturing and retail across ten different countries.

He is now a freelance Business Continuity Consultant and has spent much of the last three years in Malta, where he has promoted BCM both through consultancy assignments and BCI licensed training.

As a member of Toastmasters International, Robert is no stranger to public speaking. An experienced keynote speaker, he promotes BCM whenever the opportunity presents itself.

EXTRACT

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We would like to thank Abdullah Al Hour, author of *Business Continuity Management: Choosing to survive*, ir. H.L. (Maarten) Souw RE, Enterprise Risk and QA Manager, UWV and Thejendra BS, author of *Disaster Recovery and Business Continuity* for their helpful comments during the review process.

FOREWORD – MARTIN CADDICK, LLB MBA MBCI MIOR

It has to be admitted that most books about business continuity are dull. They shouldn't be, because the context is the stuff of news headlines. Not only do disasters excite interest, but even the process of business continuity planning – and understanding what really matters to your business – is hardly tedious.

This book is an exception to the rule. It takes a series of case studies, familiar to us from news reports, and digs deeper into what went wrong. Where other books bore us with methodology and process, this book catches our interest; and in doing so, it brings out why business continuity and crisis management really do matter and just how all-pervasive the consequences of a disaster can be.

The scale of some of the examples, such as the Piper-Alpha disaster and Hurricane Katrina, demonstrates how important this subject is. Yet we seem doomed to repeat many of the mistakes. Had the lessons from Bhopal been applied by the West Fertiliser Company in Texas, the 2013 explosion could have been avoided.

I am constantly amazed by the number of executives who dismiss potential disasters as being too unlikely to consider, or who put off dealing with known risks because they have other things to worry about. This book is full of these people, and what happens in the case studies provides ample evidence to counter their complacency.

We live in a world where we are becoming increasingly interdependent thanks to ever-faster travel and

communication. It is well-nigh impossible to foresee what combination of events might cause disaster next, nor what the range of consequences might be. The importance of being well prepared grows by the day.

The contributors to this book have taken the time and trouble to think about what lessons can be learnt from each case – not just the things that could be done better, but also things that were done well. With a little of the imagination a good business continuity or crisis manager needs, nearly all the lessons identified here can be applied in other contexts, making this a useful book for such professionals.

The nature of this subject means that we spend a lot of time dealing with catastrophes and their consequences. It is almost impossible now to avoid being struck by a so-called ‘black swan’ event at some point in the life of a business, and our success is measured in terms of ‘less bad’ rather than ‘good’. But the good news is that resilient organisations do survive disasters, and often improve their standing because they demonstrate their ability to manage crises well, inspiring confidence and loyalty in their customers and employees.

PREFACE – PHILLIP WOOD, MBE MSC FSYI CPP PSP AMBCI

Normally the preface to a book is written by its author, and I have not written a word of this one. I am very proud of *In Hindsight*, however, mainly because the authors are presenting a wider perspective on business continuity and its links to other activities, disciplines and functions. This approach is much needed in what is believed by many to be a solely IT-focused management process, which in my view business continuity is not. In reading through these case studies and the observations and analysis that the contributors make, hopefully you will agree that the wider linkages between the various elements of effective organisational resilience are recurrent and necessary to ensure anticipation, response and recovery when things do go wrong.

With an eclectic and varied background (and representing various disciplines), Robert Clark and the team of contributors have taken a broad view of some typical and not-so-typical events that have taken place and highlighted lessons from them. The title *In Hindsight* says a lot: my own specific academic interests revolve around how effectively humans manage and plan for unwanted events and there is much written about looking forward in general literature, with horizons, swans and ‘megatrends’ being referenced and quoted. All of this is thought-provoking and necessary. But it is equally necessary to look back in detail at what has happened before, as the contributors to *In Hindsight* have, and to highlight the frailties, omissions and sheer lack of effective thought that has brought organisations to the brink of disaster and beyond.

The causes of problems vary, and that is reflected in the range of cases covered in the book. So you will read about volcanoes, faulty cars, natural disasters, terrorism and diseases; and you will be relieved to see that there is discussion of IT-related issues. But you will also read about the *impacts* and lessons learned. The causes of the issues that are covered by the team of contributors are examined and analysed, and there are judgements made about the effects and efficacy of response, leading to either successful or unsuccessful outcomes. You will revisit some events that you have perhaps read about previously (you may even have been involved); and there are others that may not have come to your attention. For example, how much do you know about the effects on business of a public transport strategy for Malta? Importantly, there are no bombs, bullets, deaths, power outages or other ‘headline’ elements to that case study; simply failures to understand the continuity implications of immature strategies. Conversely, what can the catastrophic loss of life at a music festival or as the result of corporate planning and implementation failures teach us about the hubris and stupidity of humans? If you haven’t considered it before, think about the recurrent theme in the majority of these cases; humans can be vain, negligent, lazy and often stupid – and that has a high cost in every sense.

You will read case studies here not from dedicated academics and not from contributors who are all resilience practitioners in their daily lives. What *In Hindsight* provides is a collection of analysed learning experiences, seen through the eyes of contributors who live with, work in and may have been affected in some way by some of the case areas that they have highlighted. Whether your interest is in ‘disaster recovery’ in its application by the IT world,

or in real disasters that involved real people and real casualties, you will find something to learn in this book. If you are interested in tourism or terrorism, you will find them discussed here. Importantly, for me, the book and the case studies highlight the types of activity that underpin our daily lives, and therefore should be absolutely the focus of reading and learning. Businesses, consultants and managers spend a lot of time proposing ideas and planning strategies, and there is much to understand from where humans have forged ahead with their own objectives, priorities and perspectives – and failed.

As a fellow student of the issues highlighted in *In Hindsight*, I have found it to be an interesting, thought provoking and stimulating collection of studies and I have learned a great deal in reading it. Learning is the key to understanding, and understanding allows us to make the right decisions. So, whether you are a resilience professional or not, reading this book may help you to make the right decisions in the future. There is a saying: ‘Hindsight is a wonderful thing’. It is true.

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EXTRACT

CHAPTER 1: INTRODUCTION – ROBERT CLARK

In September 2010, I started out on one of the most enjoyable journeys I have ever undertaken. It was not to some strange, far off and exotic land but a return to somewhere I had not been to since my teenage years – a return to the world of academia. Two years later I graduated from Buckinghamshire New University with a Master of Science degree in Business Continuity, Security and Emergency Management. Attaining a master's degree was the fulfilment of a promise made many years before not only to myself but to my mother Vera as well. I am very grateful that, at the age of 94 years, she was there with me to witness my graduation.

Unlike many who embark upon a master's degree I had no first degree, although I justified my place on the course by the commercial business continuity experience I had gained throughout my career. Naturally, I did not make this journey alone and found myself studying in a cohort of six mature students that quickly bonded not just academically but socially too. We came from different backgrounds bringing with us our own experiences of the real world and we quickly learned to draw on each other's strengths. Our university head of department, Phil Wood, once remarked that he always learned something from our group discussions, such was the diversity of knowledge that we collectively brought to the table.

Although we did not appreciate it at the time, we started preparing the content of this book towards the end of 2010. It was then that work commenced on the business

continuity case studies which subsequently became the basis for this book.

These studies are diverse and cover many of the mainstream threats that business continuity practitioners are called upon to address. Some are based upon our personal experiences while others cover multiple threat scenarios. One such example is the 2005 Buncefield oil depot disaster, and the study even considers the question of whether it was caused by a cyber attack.

Each study looks at the events that occurred, interprets and analyses the facts while reaching appropriate conclusions and recommendations. Where similarities existed between the original case studies, they have been combined and, where appropriate, extracts from our dissertations have also been included. One such example is 'A Tale of Three Cities' which is a comparison of the terrorist attacks on Madrid (2004), London (2005) and Glasgow Airport (2007). Here the common theme is not just terrorism but the targeting of the respective transport infrastructures of the three cities.

In business continuity, we can all be guilty of thinking only of major incidents that could have a detrimental effect on our organisations. To that end, a chapter has been included which focuses on a series of smaller incidents, each of which still had the potential to have big impacts on organisations.

Amongst the studies is a contribution from Catherine Feeney, senior lecturer in Tourism, Hospitality and Events Management at Manchester Metropolitan University. Although she was not a member of the cohort, Catherine was invited to submit a chapter that focuses on the pandemic threat with specific emphasis on the impact that the 2003 SARS outbreak had on the tourism industry.

With the graduation now long since over and with a master's degree in the bag, that tiny cohort is spread across the world in several different countries. But it is good to know that our academic efforts may also be of practical use to anyone who has an interest in, or is actively involved with, business continuity, information security or risk management. It is my hope that through this book and the experiences of those that it chronicles, more and more people will come to realise the importance of business continuity.

In 1974, I first became involved in business continuity management (BCM). In those days it was simply called disaster recovery and was solely about protecting an organisation's information technology assets and electronic data. The mainframe dominated the computer world. The Internet was in its infancy and the threat from cyberspace was something you were more likely to read about in a science fiction novel than in the pages of a serious computing journal. It was to be almost another ten years before the personal computer was to arrive on the scene and over 20 before the commercialisation of the World Wide Web. Even the formation of the Business Continuity Institute did not happen until 1994. In fact, business continuity management and the Internet are about the same age.

My first involvement with BCM was as a computer operator with IBM and I was based in a computer room, or data centre if you prefer, which was about the size of a soccer pitch. Located at Havant in the UK, ten IBM System 360 mainframe computers and all their respective peripheral units filled that room. Among those mainframes were the computers designated to process all of IBM World Trade's customer orders and manufacturing logistics

transactions. That included anything that was ordered by a client outside of the USA along with all the associated manufacturing instructions. It should come as no surprise that this operation was considered mission critical by IBM.

To ensure the continuity of this mission critical operation, two or three times a year a full disaster recovery test would be performed. This necessitated undertaking what we referred to as a 'disaster fall-back test' and involved transferring the operation to an IBM location in Germany or the Netherlands. Testing would occur over a weekend to minimise any disruption to the host location and, allowing for travel time, would be done and dusted over a four day period.

By the mid-1980s IBM recognised that the 'IT environment' represented only part of the story and other aspects of its business, such as its staff, properties and even supply chain were also crucial. This started to be reflected in the various scenarios that were tested and rehearsed.

With so many businesses detrimentally affected, culminating in around 600,000 job losses, the 9/11 terrorist attacks in 2001 were a major factor in emphasising the importance of BCM globally. This was further accentuated by the subsequent launching of BS 25999 in 2006 which was adopted as the established BCM standard across many parts of the globe. Finally, after evolving for around 40 years, 2012 saw BCM finally come of age when it joined the ranks of the international standards, taking its place alongside the likes of quality management and risk management. The Business Continuity Management System, or ISO22301 as it is known, was up and running.

Through my consultancy work, I still find myself amazed at the degree of naivety that exists in both public and private sectors and the excuses offered for not embracing business

continuity, which have long since lost any originality. Recently, I became aware of the German division of a multinational company finding itself under pressure from its corporate headquarters to implement business continuity management. Not sure how to go about this, they approached their Dutch colleagues and asked if they could have copy of their plan so they could adapt it. In fairness, they had had no BCM training and had no in-house expertise that they could draw upon. Even so, they could not understand that, while they were prepared to share their plans, the Dutch said ‘of course the plans won’t work in Germany’.

Even though the products and services that both the Dutch and Germans offered were very similar, their respective business impact analysis and threat assessment exercises generated very different results. This ultimately affected what BCM strategies they each needed to adopt and how their subsequent business continuity plans (BCPs) shaped up. Or to put it another way, for business continuity one size does not fit all! Furthermore, even the most comprehensive of BCPs are effectively useless unless they are thoroughly tested and maintained.

But do you know what threats your organisation is facing and which of those could present a risk to its survival? If you have not performed a threat analysis exercise as part of your business continuity arrangements, the answer is most probably no. In fact, do you know how long your organisation has to recover from a serious incident (e.g. a fire, flood, IT failure, supply chain failure, product recall, loss of expertise, etc.) before its very survival could be placed in serious jeopardy? Is it several months, a few weeks, maybe two or three days or perhaps just a couple of hours? Five of the companies featured in this book ceased trading after catastrophes that they were unprepared for.

Most went with barely a whimper although one collapsed in the most spectacular fashion. A sixth company narrowly survived a catastrophe because of what can best be described as an ‘Act of God’.

The threat matrix that follows in *Figure 1* includes 27 threats which are relatively common and would not look out of place in the results of a BCI member survey. They all appear in at least one of the case studies in this book; most appear several times. Around half of the incidents resulted in physical injuries and fatalities. Trauma was also not uncommon. Yet only one chapter, *A Tale of Three Cities* (p. 227), devotes its attention to terrorism which helps illustrate that the workplace can be a very dangerous place.

THREAT MATRIX	
ADVERSE PUBLICITY <ul style="list-style-type: none">• <i>Northgate / Buncefield</i>³ (p. 59)• <i>Toyota</i> (p. 165)• <i>Devil in the Detail</i> (p. 300)• <i>MV Full City</i> (p. 35)• <i>Barings Bank</i> (p. 50)• <i>Love Parade</i> (p. 76)	CHANGE OF GOVERNMENT <ul style="list-style-type: none">• <i>Madrid Train Bombing</i>¹ (p. 232)• <i>Arriva Malta</i> (p. 284)
CHEMICAL RELEASE <ul style="list-style-type: none">• <i>Bhopal</i> (p. 136)	CIVIL UNREST <ul style="list-style-type: none">• <i>Hurricane Katrina</i> (p. 263)• <i>Madrid Train Bombing</i> (p. 232)

<p>CYBER THREAT</p> <ul style="list-style-type: none"> • <i>Northgate / Buncefield</i>² (p. 59) • <i>Devil in the Detail</i> (p. 300) 	<p>DATA LOSS</p> <ul style="list-style-type: none"> • <i>Aztec Chemicals</i> (p. 108) • <i>Northgate / Buncefield</i> (p. 59)
<p>ENVIRONMENTAL DAMAGE</p> <ul style="list-style-type: none"> • <i>MV Full City</i> (p. 35) • <i>Bhopal</i> (p. 136) • <i>Northgate / Buncefield</i> (p. 59) • <i>Aztec Chemicals</i> (p. 108) • <i>Piper Alpha</i> (p. 119) 	<p>EXCLUSION ZONES</p> <ul style="list-style-type: none"> • <i>Aztec Chemicals</i> (p. 108) • <i>Northgate / Buncefield</i> (p. 59) • <i>London 7/7 Bombing</i> (p. 240) • <i>Madrid Train Bombing</i> (p. 232) • <i>Glasgow Airport Attack</i> (p. 247) • <i>Bhopal</i> (p. 136) • <i>SARS Virus</i> (p. 148)
<p>EXPLOSIONS (NON-TERRORISM)</p> <ul style="list-style-type: none"> • <i>Aztec Chemicals</i> (p. 108) • <i>Northgate / Buncefield</i> (p. 59) • <i>Piper Alpha</i> (p. 119) 	<p>FIRE</p> <ul style="list-style-type: none"> • <i>Aztec Chemicals</i> (p. 108) • <i>Northgate / Buncefield</i> (p. 59) • <i>Piper Alpha</i> (p. 119) • <i>Devil in the Detail</i> (p. 300) • <i>Åsta Train Accident</i> (p. 218) • <i>Glasgow Airport Attack</i> (p. 247)

FLOODING / ADVERSE WEATHER <ul style="list-style-type: none">• <i>Hurricane Katrina (p. 263)</i>• <i>Gloucestershire Floods (p. 183)</i>• <i>Devil in the Detail (p. 300)</i>	FRAUD <ul style="list-style-type: none">• <i>Barings Bank (p. 50)</i>• <i>Devil in the Detail (p. 300)</i>
FUEL CRISIS <ul style="list-style-type: none">• <i>Northgate / Buncefield (p. 59)</i>	INDUSTRIAL ACTION <ul style="list-style-type: none">• <i>Arriva Malta (p. 284)</i>
IT / TELCO FAILURE <ul style="list-style-type: none">• <i>Northgate / Buncefield (p. 59)</i>• <i>Arriva Malta (p. 284)</i>	LOSS OF STAFF / EXPERTISE <ul style="list-style-type: none">• <i>Northgate / Buncefield (p. 59)</i>• <i>Devil in the Detail (p. 300)</i>• <i>Arriva Malta (p. 284)</i>
MALICIOUS DAMAGE <ul style="list-style-type: none">• <i>Devil in the Detail (p. 300)</i>	MALWARE / COMPUTER VIRUS <ul style="list-style-type: none">• <i>Devil in the Detail (p. 300)</i>
PANDEMIC <ul style="list-style-type: none">• <i>SARS Virus (p. 148)</i>	PRODUCT RECALL <ul style="list-style-type: none">• <i>Toyota Vehicle Recall (p. 165)</i>

POTABLE WATER SHORTAGE <ul style="list-style-type: none">• <i>Gloucestershire Floods (p. 183)</i>• <i>Hurricane Katrina (p. 263)</i>	POWER FAILURE <ul style="list-style-type: none">• <i>Alexander L. Kielland (p. 119)</i>• <i>Piper Alpha (p. 1179)</i>• <i>Hurricane Katrina (p. 263)</i>• <i>Gloucestershire Floods (p. 183)</i>
SUCCESSION PLANNING <ul style="list-style-type: none">• <i>Devil in the Detail (p. 300)</i>	SUPPLY CHAIN FAILURE <ul style="list-style-type: none">• <i>Volcanic Ash Cloud (p. 199)</i>• <i>Northgate / Buncefield (p. 59)</i>• <i>MV Full City (p. 35)</i>• <i>Aztec Chemicals (p. 108)</i>• <i>Piper Alpha (p. 117)</i>• <i>Toyota Vehicle Recall (p. 165)</i>• <i>Gloucestershire Floods (p. 183)</i>• <i>Arriva Malta (p. 284)</i>

<p>TERRORISM</p> <ul style="list-style-type: none"> • <i>London 7/7 Bombing (p. 240)</i> • <i>Madrid Train Bombing (p. 232)</i> • <i>Glasgow Airport Attack (p. 247)</i> 	<p>THEFT/INFORMATION SECURITY</p> <ul style="list-style-type: none"> • <i>Devil in the Detail (p. 300)</i>
<p>TRANSPORT</p> <ul style="list-style-type: none"> • <i>Herald of Free Enterprise (p. 97)</i> • <i>Åsta Train Accident (p. 218)</i> • <i>Northgate / Buncefield (p. 59)</i> • <i>Volcanic Ash Cloud (p. 199)</i> • <i>Arriva Malta (p. 284)</i> • <i>SARS Virus (p. 148)</i> 	<p>DISRUPTION</p> <ul style="list-style-type: none"> • <i>Hurricane Katrina (p. 263)</i> • <i>Gloucestershire Floods (p. 183)</i> • <i>London 7/7 Bombing (p. 240)</i> • <i>Madrid Train Bombing (p. 232)</i> • <i>Glasgow Airport Attack (p. 247)</i>

Figure 1: Occurrence of threats within case studies

Notes

¹ A change of Government did not cause the Madrid bombing. It is widely accepted, however, that the bombing caused the governing Conservative Party of Prime Minister José María Aznar to lose the general election on 14 March 2004, three days after the bombings, an election they were expected to win comfortably. In Malta, there was a great deal of speculation that the performance of Arriva Malta was fundamental in bringing the Government down.

² Although there is no evidence that Northgate Information Solutions suffered a cyber attack during its recovery from the Buncefield oil depot explosion, it remained vigilant and continued penetration testing of its systems. The question must be asked, however, as to why no consideration was apparently given by the official enquiry to the possibility of a cyber attack being the root cause of the disaster.

³ Even though there is no record of Northgate Information Solutions receiving any adverse publicity as a result of the Buncefield disaster, reference is made to the BP Deepwater Horizon oil spill in the Gulf of Mexico. BP CEO Tony Hayward’s on camera comment ‘*I’d like my life back,*’ was a public relations disaster.

Figure 2 below indicates which of the case study incidents resulted in fatalities.

CASE STUDY INCIDENTS THAT RESULTED IN FATALITIES		
<ul style="list-style-type: none">• <i>Bhopal (p. 136)</i>• <i>Piper Alpha (p. 119)</i>• <i>Alexander Kielland (p. 119)</i>• <i>Åsta Train Accident (p. 218)</i>• <i>London 7/7 Bombing (p. 240)</i>	<ul style="list-style-type: none">• <i>Madrid Train Bombing (p. 232)</i>• <i>Glasgow Airport Attack (p. 247)</i>• <i>Gloucestershire Floods (p. 183)</i>• <i>Toyota Vehicle Recall (p. 165)</i>• <i>Herald of Free Enterprise (p. 97)</i>	<ul style="list-style-type: none">• <i>Love Parade (p. 76)</i>• <i>SARS Virus (p. 148)</i>• <i>Hurricane Katrina (p. 263)</i>

Figure 2: Case study incidents that resulted in fatalities

CHAPTER 2: THE MV 'FULL CITY' INCIDENT – NORWAY'S WORST EVER OIL SPILL – JON SIGURD JACOBSEN

'This [oil spill] happened close to our summer house. The day after we had bathed from a beautiful stony beach, it was covered with crude oil!' – (Thor, 2009).

The MV *Full City* was a Panama registered bulk carrier with a gross tonnage of 15,873 tonnes. It was capable of taking a cargo weighing around 11,000 tonnes creating a deadweight tonnage of 26,758 tonnes. Built at Hakodate, Japan, it was completed in 1995, Chinese crewed and Chinese owned by the Roc Maritime Inc. It has twice made headline news. In 2011, it was attacked by Somali pirates in the Arabian Sea although it was swiftly rescued by a combined United States, Turkish and Indian naval force.

This case study, however, examines the earlier headline news event involving the same ship when it ran aground some two years previously, leaking its fuel oil in the process. It considers whether the incident was preventable, what the environmental impact for the surrounding area was, as well as the local response capability and the supply chain issues affecting YARA International ASA that had chartered the vessel.

At the time of this earlier incident, the ship was being operated by the China Ocean Shipping Company, known as COSCO. A Port State Control inspection had been performed in Kaliningrad, Russia, prior to the incident. This highlighted four inconsequential faults with no apparent

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relevance to what subsequently happened. It can therefore be concluded that the vessel was considered seaworthy.

On 23 July 2009, MV *Full City* received orders to transport mineral fertilizer, on behalf of YARA International ASA, from the Norwegian Port of Herøya to Puerto Quetzal in Guatemala. Loading was due to commence early in the morning on 1 August. In preparation, the ship needed to be at anchor the previous evening off the island of Såstein approximately three nautical miles from the mouth of the Langesund fjord. The following morning it was scheduled to have sailed up the fjord to Herøya to be loaded with its cargo.

Langesund and surrounds is an area of outstanding natural beauty and the location of the nature reserve of Lille Såstein, a nesting area for seabirds. The region incorporates the Norwegian counties of Vestfold, Telemark and Agder which have a combined population of over 500,000 inhabitants. It also has a coastline of approximately 4,000 kilometres, including all the islands. The tourist and fishing industries provide an important income for this region.

The incident

On July 30th the *Full City* bunkered off Skagen in Denmark and was fully fuelled when it arrived in the mid-afternoon at the anchor buoy off Såstein Island. It was understood to be carrying circa 1,005 tonnes of heavy oil and 120 tonnes of diesel oil. The anchorage was located approximately 0.9 nautical miles from the coast. Late in the evening the weather deteriorated and gale force and possibly even storm force winds were forecasted. When the storm finally broke, the subsequent height of the waves was believed to be between four and six metres. By 23:51 the *Full City* had

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slipped its anchor and the local automatic identification system, which can recognise a vessel as well as its course and speed, detected that the ship was drifting.

Roughly 18 minutes later the Captain of *Full City*, Zong Aming, took command of the bridge. Driven by the strong winds, the ship was drifting with a speed of between two and three knots and was by now only 0.3 nautical miles from the coast. Realising the seriousness of the situation, the captain gave the order to immediately start the main engine. His intention was to manoeuvre the ship away from danger but he failed and it ran aground at 00:23. The engine room flooded, stopping the main engine.

Shortly afterwards a rescue operation commenced and 16 of the 23 crew were airlifted from the stricken vessel by helicopter. The remaining seven crew members stayed on board the ship with the aim of damage control. With the vessel now badly damaged and well aground on the sandbanks of S stein Island, it started shipping its engine oil. Strong winds and rough waves continued to damage the *Full City* through the night.

Following the event an investigation took place, and its stated purpose was as follows:

'The sole objective of this marine safety investigation is to reveal the circumstances and causes and contributing factors, with the aim of improving the safety of life at sea and avoiding future accidents. It is not the purpose of this investigation to determine liability or apportion blame.' – (Accident Investigation Board Norway, 2009).

This did not prevent the Norwegian police arresting and charging the *Full City*'s Captain, Zong Aming, and the

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Officer of the Watch, Oilann Lu, under anti-pollution and maritime safety laws. A study conducted over ten years by the Transportation Safety Board of Canada, which examined over 4,000 commercial marine incidents, had concluded that over 25% involved vessels running aground. Moreover, Mazaheri states that as many as 80% of commercial marine incidents can be attributed to human error. Midtgård takes a different view. She claims that marine accidents are mainly caused by two combinations – either bad weather in combination with ships which are in a poor condition or bad weather in combination with human failure. Consequently, the finger of blame was always likely to point at the captain and whoever was the officer of the watch.

When the enquiry subsequently revealed that the anchor fluke had broken off during the storm, explaining why the captain mistakenly believed the ship was safely moored, he and the senior officer pleaded not guilty. Despite their pleas of innocence, both men were given short jail sentences having been found guilty of breaking both maritime safety laws and anti-pollution laws. Both sentences were suspended owing to the time they had already been detained.

The local response

This operation was initiated under the pollution legislation and was led by the Coastal Directorate. Local authorities (IUA) took the regional lead within their territories. Also involved were the Norwegian Coast Guard, the armed forces and local civil defence, fire brigade and municipalities. From the private sector, support came from NOFO, Exxon Mobile's Slagentangen refinery, with the

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Swedish Coast Guard also providing assistance. A number of non-governmental bodies, the World Wildlife Fund, plus volunteers both local and international were also present. Unemployed Norwegians were also encouraged to participate in the clean-up.

The operation was divided into two main phases. The acute phase was carried out in the first 13 days with the primary goal of addressing the threat from oil that had not yet made shore. The second phase dealt with cleaning the polluted coastline.

'I am very glad to hear that the Norwegian Coast Guard believes the situation will return to normal for the areas affected by the oil spill.' – Helge Pedersen, Coast Affairs Minister.

Despite Pedersen's optimism the ensuing clean-up operation continued well into 2010 and was calculated to have needed some 18,000 man-days effort, including support from the many volunteers. The estimated cost was €25 million. Winter working conditions such as limited daylight hours, drift ice and temperatures as low as -20° Celsius were not conducive to achieving a swift resolution.

Despite being the fourth oil spill in Norwegian waters in five years, the clean-up operation was not without its critics. Poor operational control, lack of local experience, safety issues for personnel plus private contractors demanding large pay-outs were among the issues raised by critics. Moreover, no regard appeared to have been exhibited for the chain of command. In fact, without international support the local Norwegian effort may have proved inadequate. When considering the health and safety issues inherent in dealing with an oil spill, practical

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experience is worth far more than formal academic qualifications alone.

'This government has increased spending on oil spills on land, but unfortunately, they have forgotten that there is an urgent need to establish a state-run cargo ship emergency response unit in southern Norway.' – Marius Dalen, Bellona Oil Industry Advisor.

A further weakness originated from the lack of mutual understanding of how each of the bodies involved were operating, and a lack of collaboration was similarly evident. This flaw seemed to go both vertically and horizontally within the participating organisations, with each apparently following its own agenda.

It also transpired that the IUA Departments in the counties of Telemark, Vestfold and Agder each used different management systems. Moreover, they were unprepared to deal with a scenario of this magnitude, especially as their plans were outdated. This only served to introduce inefficiencies into the overall management of the situation.

The environmental damage

'The swimming season at Krokshavn and Steinvika is definitely over for this year.' Jon Pieter Flølo, Mayor of Telemark

The incident occurred at the height of the summer tourist season. At the time it was reported to be the worst ever oil spill in Norwegian waters. Approximately 10,000 m of booms plus a further 10,000 m of absorbent booms were deployed in an effort to restrict the oil dispersal. Even so, the oil pollution was observed across an area from Stravern

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to Grimstad, a distance of around 150 km. This was the fourth serious oil spill in Norwegian waters over a five year period, with incidents having also occurred at Rocknes (2004), Glomma (2006) and Server (2007).

The oil spill occurred very close to a seabird breeding ground. A variety of birds were put at risk by the oil spill, with an estimated 2,000 birds having to be destroyed.

'The accident could not have happened at a worse time. Although the nesting season is over the birds are still vulnerable, as from now until the end of August most of them are on the sea with their young.' – Norges Naturvernforbund.

An international response team was quickly formed with the objective of catching, cleaning and rehabilitating as many of the affected birds as possible. Support came from Belgium, Germany, Sweden and the UK. Local support was considered to be weak as the authorities lacked knowledge about how to deal with incidents of this nature. Moreover, there were insufficient numbers of suitably trained personnel in Norway.

The islands around Stråholmen, home to a colony of seals, are located in the contaminated area. While the mammals were exposed to the oil, however, it is believed the incident occurred just before they shed their winter coats. This fortunate timing enabled them to self-clean and no subsequent adverse effects have since been observed.

'The most serious threat of oil spills to fisheries and aquaculture activity is the economic loss arising from business interruption.' – (Clean Caribbean and Americas, 2004).

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Marine researchers were concerned about the potentially harmful effects that the pollution would have on the local marine life. Both the oil and un-cleaned ballast water escaping from the vessel threatened the local breeding grounds for fish, shell fish and shrimp. Serious oil spills can expose marine life to both toxins and carcinogens that are known to exist in petroleum products. The Norwegian Food Safety Authority (NFSA) recommended that mussels and fish from the area that smelled even remotely oily should not be consumed.

Immediately following the *Full City* incident, a study of the effects of the oil spill on marine life was conducted by the Norwegian Institute of Marine Research. Over an eight month period, their findings showed a steady decline from the initial high concentration of contamination detected in local mussels to a level acceptable for human consumption. At his point, the NFSA withdrew its recommendation not to consume them. The institute's research also focused on fish in the area, although they could find no evidence of any contamination nor could they demonstrate that the fish had been adversely affected in any way.

Supply chain issues

YARA International ASA is the world's largest manufacturer of plant nutrients and supplies food and renewable energy for the world's increasing population. It has offices in more than 50 countries and makes yearly shipments of more than 20 million tonnes of plant nutrients to over 120 countries. The Norwegian state is the company's largest single shareholder. YARA's Porsgrunn factory, near Herøya, covers an area of 1.5 km² making it

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Norway’s largest industrial site. *Figure 3* shows its current annual production volumes:

PRODUCT	QUANTITIES
Ammonia	500,000 tonnes
Nitric Acid	1,320,000 tonnes
NPK Fertilizer	2,000,000 tonnes
Calcium Nitrate Fertilizer	810,000 tonnes

Figure 3: YARA Porsgrunn product output

A replacement vessel, *Universal Amsterdam*, was chartered and the Guatemala order despatched on 14 August 2009, less than two weeks after the originally planned shipment. The gross weight of the order was around 11,000 tonnes. Had the order been cancelled, it would have represented a potential sales loss of no more than 0.55% of YARA’s total Porsgrunn NPK fertiliser annual production. Not a significant amount for the company to lose.

There is no information available regarding the impact of late delivery for the recipient in Guatemala of the fertiliser shipment, or on their downstream supply chain which was presumably the local agricultural industry. With the shipment arriving less than two weeks later than scheduled, however, even if the recipient was operating a just-in-time supply chain model the impact may well have been minimal. It is also unlikely to have resulted in a significantly reduced yield from the crops the fertiliser was intended for.

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Conversely, the owners of the MV *Full City* would have not only forfeited the YARA shipment income but also any potential future revenue lost while the vessel remained in an unseaworthy state. It was a full six weeks before the ship was towed to Gothenburg, Sweden, to undergo extensive repairs. It was still in Gothenburg in April 2010, over eight months after the incident. To compound these losses, the Norwegian authorities imposed a US\$39 million fine on the *Full City* owners, COSCO Shipping. Two years after the incident, six COSCO owned bulk carriers, including the *Full City*, were reported as being up for sale as the owners looked to deal with serious cash flow problems. Renamed the *Rising Eagle* in November 2011, the ship has new owners and now sails under the flag of Saint Vincent and Grenadines.

Insurance claims

Compared with the 2010 BP Deepwater Horizon oil spill in the Gulf of Mexico, where combined insurance settlements are expected to amount to billions of dollars, claims from the *Full City* oil spill were never going to be in the same league. One hotel complex in Langesund, however, did register a claim for 35 million Norwegian Krone – approximately US\$4.5 million.

Lessons learned

Let us first put this event into perspective. Although it was Norway's biggest spill at the time, only approximately 200 tonnes of oil escaped from the *Full City*, since the remainder was pumped into a barge during the salvage operation to avoid any further pollution. When compared with other oil spills involving ships, this quantity of oil

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rather pales into insignificance as illustrated in *Figure 4*, below:

SHIP	LOCATION	DATES	OIL SPILT (TONNES)
Full City	Langesund, Norway	2009	200
Hebei Spirit	Taeon, Republic of Korea	2007	11,000
Prestige	Galicia, Spain	2002	63,000
Sea Empress	Pembrokeshire, UK	1996	72,000
Exxon Valdez	Alaska, USA	1989	37,000
Amoco Cadiz	Brittany, France	1978	223,000
Torrey Canyon	Isles of Scilly, UK	1967	119,000

Figure 4: Examples of groundings resulting in oil spills

Moreover, while not resulting from an incident involving a ship, the BP Deepwater oil rig accident in the Gulf of Mexico resulted in excess of 500,000 tonnes of oil escaping. As the Norwegian authorities seemed to struggle to deal with such a comparatively small quantity of oil, how would they have coped with some of the far greater oil spills that have been inflicted on other nations?

Was the incident preventable?

‘The captain is ultimately responsible, under the law, for all aspects of operation such as the safe navigation of the ship.’ – (Aragon & Messner, 2001).

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Captain Zong Aming was reported to have retired to his cabin prior to the incident, leaving Oilann Lu on duty as the officer of the watch. This was one of a number of key factors which undoubtedly contributed to the incident.

- The Captain ignored warnings not to anchor too close to the shore as gale force or even storm force winds were forecast.
- The officer of the watch, Oilann Lu, was undertaking this duty for the very first time. Consequently, he would not have had first-hand experience of being in charge of the watch while dealing with weather of the ferocity encountered, even while at anchor.
- From the time the *Full City* slipped its anchor to the arrival of the captain on the bridge was a full 18 min. Given the circumstances, this represents either a breakdown in on-board communication, a general absence of urgency displayed on the part of the captain and the officer of the watch or a lack of appreciation of the seriousness of the situation.
- While it is true to say that the breaking off of the anchor fluke was an unexpected event, the captain's responsibility for the safety of his ship and crew under international maritime law is clear. Moreover, had he taken local advice and anchored the ship further from the shore, maybe there would have been sufficient time to avoid running aground.

What went well

- Although the YARA fertiliser shipment to Guatemala was delayed by the grounding of the *Full City*, the company simply organised a replacement vessel.

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- Swift support from the international community to assist with the environmental clean-up. Without it Norway would have struggled.
- The initial damage limitation phase (preventing as much oil as possible coming ashore) was completed within the first two weeks.
- The majority of the fuel oil was pumped out of the *Full City*, preventing further contamination.

What could have been done better

- Every organisation involved seemed to work to its own agenda, often appearing to be unaware of how others were functioning and in what way they should interface with each other.
- Absence of respect for the chain of command.
- Animal/bird rehabilitation was not part of the official response plan.
- The local volunteers lacked experience particularly regarding the handling of wildlife.

What did not go well

- Media communications were badly managed with mixed messages being broadcast and inappropriate levels of expectations being set.
 - Local authorities' response plans proved inadequate and out of date while testing and training of personnel proved ineffective.
- The clean-up of the coastline proved more complicated and more expensive than expected. Allowances had not

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been made for winter weather conditions and limited daylight hours.

- When inclement weather is forecast, the coastal directorate should have the authority to enforce ships anchoring too close to shore to relocate to a safer distance.

Other observations

- YARA's route to market from Porsgrunn passes through the port of Herøya. A serious incident in the port such as a protracted strike could cripple its supply chain.

Conclusion

In some ways, Norway was quite fortunate; compared with other sea based oil spills, this was not a major league catastrophe. The *Full City* was a comparatively small cargo ship rather than an oil tanker carrying hundreds of thousands of tonnes of petroleum products. Furthermore, the proximity of the oil spill to a populated area with relatively good infrastructure made the clean-up operation a lot easier than it might have been. Had the disaster occurred in a more remote and less accessible part of the Norwegian coast, far greater challenges would have presented themselves.

Maybe Norway has just been unlucky, but four oil spills in a five year period would suggest that the writing is on the wall. It is only a question of when and where a similar and perhaps more devastating event will occur next. With that in mind, the Norwegian government should take steps to prepare their response. Appropriate training programmes should be introduced to improve response to both

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environmental clean-up operations and wildlife rescue endeavours, and a national level response plan should be developed and suitably validated to deal with similar emergencies in the future.

EXTRACT

CHAPTER 3: BARINGS BANK COLLAPSE – OWEN GREGORY

This study analyses the collapse of Barings Bank and will demonstrate both the failure of internal controls and the problems initiated by deregulation within the financial industry. The infamous failure of the bank in 1995 was by no means the first time it had courted disaster.

In 1762 Francis Baring established a merchant bank in Mincing Lane, in the City of London, trading in cochineal, copper and diamonds. Barings Bank also became an 'acceptance house', guaranteeing the supplier would be paid by the buyer through the provision of Bills of Exchange.

After surviving near financial disaster in 1774 and 1787 Barings grew to become one of the finest merchant banks in Europe, even helping to broker the Louisiana Purchase in 1802. In 1890, however, a scheme involving buying large sums of Argentinian debt went badly wrong when the Revolución del Parque caused the South American country to default on its payments, and lack of confidence in Barings almost caused its foreclosure.

'There was no getting away from the almost unthinkable consequences if Barings did go down, not only would the failure of the City's leading acceptance house inevitably bring down a host of other firms, including all the discount houses, but the very status of the bill on London would be threatened, and thus the pre-eminence of the City as an international financial centre.' – David Kynaston (Fay, 1996, p. 11).

- Business Continuity Management: Choosing to Survive

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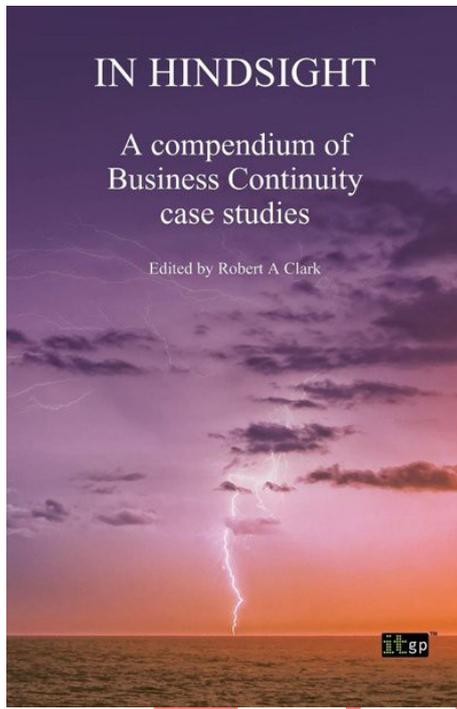
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