

Bugsplat – a case study in crisis management

Helen D Shannon, FIChemE

OCTO Ltd

Summary

An entertaining walk through the principles of crisis management in the processing industries:

Responsible Care Chemicals manufacture 'Bugsplat' a highly toxic insecticide. The scenario is based loosely on an incident which almost happened, but didn't. The management team respond promptly and responsibly to a challenging situation, but as the event unfolds, the reader is invited to consider what more could they have done to avert what ultimately becomes a very nasty crisis indeed.

Introduction

Much is written on the need for effective crisis management and even more importantly for effective crisis prevention. Yet practitioners in the field know with, a wan measure of personal humility, predictable achievement of either objective remains elusive.

1 Crisis: A definition

It's Greek origin means "Decision". In the Chinese equivalent there is an intriguing dichotomy: on one hand "Fear", and on the other "Opportunity".

Crisis Dimensions

On the receiving end of crisis, the outbreak is almost certainly unexpected. The dimensions of crisis are so obvious that they are inclined to be forgotten. They are, essentially, four dimensional: comprising *time* and *space*. The key thing to remember is that the time dimension dominates. Other likely characteristics are malignancy and instability, bringing uncontrolled threat to life, to the

environment or to some major social or economic system.

Concerning disaster, it is as well at the outset to rehearse the worry quotient in the public mind. This generally follows damage to life, environment, infrastructure and plant in that descending order of priority. Popular anxiety about BSE, for instance, was focused upon soggy brains (conceivably one's own), rather than the economic well-being of farmers. With SEA EMPRESS, concern was for birds and beaches; no-one cares many figs for the ship, her social function as a purveyor of energy, or who will pay. The Barings affair was news-worthy mainly because top people (presumably fat cats) evidently had failed disastrously; also there was an enthralling personal tale, for good or ill, in the figure of Nick Leeson, alone but for his pretty wife - at least until he was locked up. This reminds us that the wild card in the public perception is - alas - probably that little bit of spice. It is important to remember these facets when involved in crisis oneself. It is difficult not lampoon the frailties in the public attitudes to crisis; they can nonetheless be critically important and we trivialise them often to our cost.

A war on two fronts

To complete the agenda we need to flag up the bi-polar nature of almost any crisis or emergency. There is the emergency itself, where we are busy saving life, preserving the environment, and doing what we can to save the structure - whatever it may be. Then there is the perception of what has occurred and what is being done about it, in the eye all sorts of beholders, ultimately - in a democracy - generally the public. Again, BSE provides a rich example. True to form, this ran as a twin-track affair: there was a predictable gulf between the technical aspects and the

embarrassment to the government. In sum, crisis is typically a sudden and imposed war on at least two fronts.

Outside the procedural envelope

Another foundation point is that crisis has a way of getting outside the so-carefully-prepared plans - and related procedures. We are generally lucky if the actual event turns out to be a reasonably close relative to what we had in mind. Please do not think I mean by this to diminish the importance of plans and procedures. We must just remember that crisis has an inexhaustible capacity to surprise.

Principles of crisis management

I thought it would be useful, therefore, to offer for your consideration some principles of crisis and emergency management. Whilst I and my colleagues have attempted in our work to return to first principles, these are not original: indeed one trenchant source dates from at least 500 BC. This only serves to underline that there is nothing much new about crisis!

The case study which follows focuses on people and how they respond in emergencies and in crisis – both are taking place. It shows how people can be both helped and hindered by procedures. And so we remind ourselves how vital it is to achieve strength in depth within an organisation both within its emergency and crisis response.

The study is fictional but is based on an incident that very nearly happened. Before I begin, I would like to draw your thoughts away from emergency planning and on to the stage when the plan is in full cry - what I will call the operational stage of an emergency. In the situation I am going to describe, the emergency plan was all it could be, but no plan could have prepared the organisation for the particular sequence of events that occurred. The emergency moved very rapidly to a point 'outside the operational envelope' and people responded as best they could. As ever, people are not perfect and perhaps some of the judgements could be improved with hindsight. But we shall come to that later.

2 A case study in crisis management

The emergency

The scenario moves between the London HQ of the large chemical company Responsible Care Chemicals (RCC) and one of their manufacturing sites in the Midlands.

It is 14.30. A journalist from the Midlands Times phones to request product and toxicity information on the biocide 'Bugsplat'. "Is it true the poisoning effects are irreversible and fatal?" The duty press officer promises to provide the information and goes in search. Requests of this type are common enough but the tone of this was a little unusual. He muses on it as he faxes off the fact sheet. A casual encounter with his boss turns the muse into a concern which starts a chain of communication both up to the Corporate PR Manager, and back down to the Biocides Unit HR manager and, through him, to the site itself. Each stage draws a negative until, at about 16.00, on-site, the only available person is the Technical Manager. "Any problems or incidents? We have had a press query about Bugsplat." The Technical Manager replies that there has been a local problem of water contamination that morning, but it was contained within the site and is all over now. "Can't imagine the events could be related", he says.

Where are we in the anatomy of the incident, if this is an incident? You may with justice say "of course it's an incident; otherwise why are we wasting time with it?" Fine. Something (we shall discover) is indeed amiss, and this is the opening of the Corporate echelon of the saga. What should Corporate HQ be doing? Certainly seeking more information (Principle 2)? I think so.

And indeed the HR manager is not paid to be convinced easily and decides to make a few more phone calls. The Technical Manager, Joe, returns to poring over some recent modification diagrams for the site water system.

In the meantime - what has actually been going on?

At about 11.30 in the morning, the canteen cook ran some pale brown liquid out of a tap and into the tea urn. It looked like oil. Taking a dim view, she

called the site safety officer who bravely declared the first crisis of the day - lunch off - and took a water sample for testing. At 11.50 the lab returned their verdict - "Bugsplat" - a deadly poison - presumably leaked into the water supply from the plant.

At 11.52 the Production Manager's budget meeting is rudely interrupted.

At 12.00 the Production Manager, shift superintendents and the site Safety Manager convene an emergency meeting. Within 20 minutes a preliminary plan is underway and over the following half hour they: shut down all domestic water supplies, and make contingency provision for water and pizza; the medical centre is alerted and orders more antidote; all work-teams are warned of an isolated incident and asked to report anything unusual in the water; site drains are checked for contamination; a message is left for Site Manager to call in.

What do we think of the show so far? 50 minutes after the initial detection of the incident a senior group incorporating line management has conducted an initial assessment. They have put in hand some sensible measures. What have they missed? There is at this juncture a golden rule. It is essential to consider the full spectrum of possibilities, and this must include a considered examination of the worst case. True, we must not fall victim to our nightmare fears, but what the nuclear power industry terms the "maximum credible accident" consequent upon this set of circumstances must be examined. The next question, following the worst-case "what if", is "if so, then how long have we got?" This may lead to some skeleton forward-looking critical action planning - broad brush, but comprehending key points. Consequent actions need to encompass a sensible balance of probabilities. On one hand, the assembly of resources to deal with the more lurid possibilities can always be stood down (note that delay time in alerting can never be recovered); on the other, there may be (as now) grave issues of public alarm to consider. Turning back to our principles, major ingredients of Principles 1-5 should by now be in operation. We may question whether this was sufficiently the case amongst this basically competent and well-motivated team.

What, for instance, is the articulated aim at this stage, and who knows about it?

By 12.30 the formal site emergency management team are gathered. This comprises the Duty Senior Manager, the site Safety Manager, the Production Manager and the site doctor. The Duty Senior Manager manages the Research Department. He is a highly intelligent chemist but has four difficulties: he does not know the plant well, he is a very busy man and has not been able to exercise this occasional responsibility effectively, he is ill-disposed to stand back, and - true to his calling - he finds it intellectually offensive to make decisions without a full inventory of relevant information. Whilst keenly aware of his responsibility in such circumstances, he feels compelled to defer extensively to the Production Manager.

His approach overall sits uncomfortably with both Principles 3 and 7.

The team presses forward however and takes the view that it is satisfied with the measures taken to assess and contain the on-site problem and turn their attention to the off-site risk. Is there one? And if so, what do we do about it?

Let us say the time is now 12.45 - 1 hour and 15 minutes after the detection of the incident. Well, we are asking the right questions.

Piping and isometric drawings are gathered together of the site water system and towns water interface. They are known not to be wholly up-to-date, but there has recently been some maintenance on them, and the Technical Manager, of long experience, directed the contract team. He is called in for a view. Steadily information filters in: There is no drains problem, the effluent is clear. There are no reports of anyone on-site suffering ill effects and there are no reports of other contamination across the site.

The Shift Supervisor calls in with an idea. The plant is washing out the product stock tanks - the wash water is recycled to a slops tank - could this be the cause? The Technical Manager is confident that there is no off-site risk. The Safety Manager comments that it would be very difficult to check it out without raising widespread alarm and publicity.

The team pores over the piping and drains diagrams. There is no possible point for cross-contamination from the slops line to the canteen, but the Technical Manager recalls that about 9 years ago, during a big freeze and a lot of burst pipes, there was an emergency line run to the canteen - the drawings were not updated. The tank washing system that was put in 5 years ago might have inadvertently linked up to it. The theory is tenuous, but the best on offer. Why it should affect the canteen now is difficult to imagine - but the layout would suggest that the canteen would be the only building affected.

By 13.30, the site management has a working hypothesis. The tank washing, for a reason as yet undetermined, is contaminating the canteen water supply. The instruction is given for the tank washing to stop. The canteen water supply is turned on and allowed to run. Over a half-hour period the water runs clean. Samples analysed in the laboratory show that the contamination is reduced to trace quantities. The flushing continues.

It is now 14.00, some 2½ hours after incident detection. In decision-making terms, what is happening? The emergency management team had focused upon the first coherent option identified. It happens to be a convenient solution, and happily (so it then seems) it has anticipated any need to take the matter outside the inner circle, either up the line-management tree or into the public domain. Has the process so far been sound? I think we would agree that it has been sufficiently flawed to enable the Wicked Wizard (who has been quietly stacking up cards) to start winning some quick and nasty tricks shortly - and of course you are right.

I would like here to digress and insert a quote from the first leader of the Economist, dateline 30 March 1996, concerning the BSE affair. After a balanced review of the key factors and attitudes, it concludes (and I quote):

"These mistakes all flow from the same source: a reluctance to take seriously a tiny, but greater-than-zero, risk of a dreadful outcome. This reluctance, in turn, was presumably based on 'the damage to confidence' that would result from acknowledging, exploring and discussing the risk.

Apparently, despite everything, British ministers are not yet ready to abandon that attitude." End of quote.

Back to the Biocides Unit site of Responsible Care Chemicals.

At about this time the Site Manager calls in and is briefed. He is satisfied with the investigation, but suggests that the site Human Resources and Public Relations managers be informed, as a precaution. He undertakes to do this and leaves a message with the site HR Manager's secretary for him to call either himself or the site Production Manager (who seems de facto to be in charge of the emergency response team) - he does not however say it is urgent. He leaves for home before taking a late afternoon plane to London, where he is expected for a working dinner engagement before a meeting tomorrow.

What do we think of the participation of the Site Manager? Certainly he has demonstrated trust in his team and is standing back. Has he, at the least, asked enough questions? Has he achieved sufficient personal penetration into the issues? Has he done his own worst case analysis and applied time dimensions? Has he stimulated the team to think laterally? Can he now be contacted?

By 14.30, the situation appears to be under control. The canteen water supply will remain out of order until the pipework is stripped back to the town's water head tank and replaced. The tank-washing lines will be dug up and the layout checked out. Fortunately, some of the pipework is already exposed due to the recent maintenance work. There will be a detailed investigation, once all the facts are established.

In the meantime, one or two minor events have happened which have not yet come to the attention of the emergency team.

At 12.45 the site gatehouse received a query from a nearby factory - RB Rubbers - asking if the site had a drains problem because they had received some complaints from some nearby houses. They have checked and are clear - could it be RCC? The gatehouse duly initiated the site environmental

complaints procedure: they checked the effluent meter, which was clear. They took an initiative by phoning around all the plants asking if any of them had an effluent problem and again the response was no. They reassured RB Rubbers - "No, not us" - and then make out an environmental investigation report copied to the Production Manager and Site Manager. This is a routine affair. The report is for 'in' trays. Anyway, the Manager is off-site and the Production Manager is tied up in some urgent meeting. This zealously executed procedure has however failed to provide a crucial and timely link.

After the emergency meeting, the Technical Manager quietly goes back to his office and tries to work out how the contamination could have come about. He looks into the recent maintenance schedule, and an uncomfortable idea begins to dawn on him. He gets out some old drawings from his cupboard and goes for a walk over to the new town's water pipeline.

So we are at 14.30, 3 hours into the incident. With the luxury of hindsight, let us take a further look at the situation.

The somewhat hierarchical communication down the PR line from HQ is slowly, but too slowly, *approaching* the heart of the matter. The company's line management has known something is amiss for some 2½ hours, but has yet to make the link between a plant problem and an unusual press enquiry.

Although the site emergency management team responded promptly and responsibly, it has been a little too willing to accept the comfortable hypothesis that the contamination had not spread outside the gates. Fear of the repercussions of starting such an investigation has no doubt contributed. But this conclusion has been settled upon without full resolution of the cause of the contamination. Neither Production Manager nor Safety Manager, nor indeed the Site Manager has exercised enough curiosity to establish why now - of all times - this has happened. If they noticed that the Technical Manager has been unusually quiet and had probed further, they might have obtained more information.

As you have guessed, the environmental complaint is in fact related to the "Bugsplat" leak, but strict adherence to procedure ensures that the Production Manager will remain ignorant of the truth for some while yet.

Failure on Principle 6, which amounts to the mis-application of the qualities of the team (despite good intentions and the talent available), is magnifying alongside accumulating failure across

the full span of Principles 1-5. Lack of objectivity, with ensuing lack of any articulated aim - let alone any dissemination of such an aim - is the core weakness, from which the others have devolved. There is no chance of making headway with Principle 7 - the converse of flexibility is in play. With the actual cause still undiscerned alongside a tunnel-vision pursuit of flawed assumptions, there is no notion of "seizing the day". The enemy (Principle 9) is still-inanimate *Time*. But surrender of the initiative is going to create animated opposition soon enough.

At 15.00 the site HR Manager calls the Production manager. He gets a briefing on the incident and asks for an incident report to be faxed over - just in case. The Production Manager phones the Technical Manager and invites him to write up a summary of the incident and fax it to him. The Technical Manager moves uneasily in his chair, turns to his keyboard, takes a long swig from his hip flask and begins to type.

At 16.00 hours, the Technical Manager faxes a copy of the incident report to the site HR Manager. Shortly afterwards, the Biocides HR Manager is on the line to the latter, before faxing through the incident report to HQ PR. At about the same time, HQ PR receive a further enquiry from the same journalist who had been sent the Biocides fact pack - asking if there had been any problems with the water supply from the Biocides site. Armed with the incident report, HQ give the reply that the site had had no problems that could possibly have affected the local water supply that day.

It is 16.30. The local radio news is on in the mess room. The plant operators hear that there has been a water contamination problem in the downtown area - where the site is situated. A street of houses and a retirement home have been affected. "Environmental Health analysts are still trying to identify the agent and its source is a mystery. Local companies, including RC Chemicals who manufacture the biocide Bugsplat, have given reassurances that there is not cause for concern". There follows an interview with an old gentleman from the local retirement home. "We noticed something wrong about lunch time, when the parrot just keeled over. We had just filled up 'is water trough - so we thought - it must be 'is water.' It was a bit brown like - but pale - like a rusty pipe.

We had all had tea. We took a sample and phoned the water company."

The control room phones the Production Manager - just about to go home after a bad day. As he digests the information, his reluctant consciousness tries hard to avoid the impact of a very nasty thought. At that moment the Shift Supervisor drops into his office with the environmental complaint report. Between them they look at it. RB Rubbers is only a field or so away from the retirement home.

The Production Manager takes a few deep breaths and very slowly dials the site emergency number.

Clearly the crisis is just about to break. The enormity of the problem becomes clear with a few facts about "Bugsplat". "Bugsplat is absorbed in the lower colon - about 12 hours after ingestion. Once a certain amount is absorbed, irreversible liver damage begins, which, if untreated, proves fatal in about 2 to 3 weeks. There is an antidote, which must be administered before absorption commences."

Before we turn to the high-level crisis management, let us just complete the review of the first stage.

The Technical Manager is of a type who immerses himself in technical information and does not think about the wider political picture. He knew that if contamination had taken place, then it was now over and therefore he thought that there was nothing more to be done. He did not think about the implications for emergency response and the reputation of the company. No doubt his actions were also influenced by the knowledge that he might be to blame for releasing chemicals and possibly even poisoning people. Under such stress, the mind does not behave logically. In his case, he took refuge in his technical diagnosis. He has never received any training in crisis management and has no idea what is going to happen.

Now the company is trying to initiate an emergency response outside normal hours. People take longer to respond - and there has already been a very serious delay. Visitors to the retirement home

are now scattered, and will be difficult to trace and contact. One couple, plus their young family, is on a 3-hour train journey home.

The company has given, unwittingly, untrue information to the press. This has damaged credibility, which will be difficult if not impossible to restore.

The Production Manager does not yet have a direct communication line to the HQ PR response cell and has not been trained to give information in immediately usable form. By the time the senior site emergency response is in action more time has been wasted.

Not a cheerful situation. The scenario unfolds.

The crisis and worst-case potential is, at length, recognised by line management at about 16.30, some 5 hours after the water contamination took place. Yes, the two major lines of crisis management are now starkly clear to the senior management team: the management of the operational crisis, and the management of external perceptions. But the key players are rattled and stress is at large. The two main teams (site and HQ) are having difficulty in co-ordinating. Articulated objectives are emerging, but the harmonisation of priorities between centres will continue to be challenging - and, against an extremely severe time base, less-than satisfactory.

Management of the operational crisis

The site senior management team fortunately works late and has been mobilised within half an hour - we are now at 17.00, 5½ hours after the likely first sip of Bugsplat. The notation "6½ hours and counting" is belatedly displayed in enormous letters on a central white board in the site emergency response centre. By good fortune, the site Manager has been retrieved from the Executive Lounge at the Airport. He takes direct charge of the operational management of the crisis on site at 17.20. His team's focus is to prevent loss of life by providing a fast and effective emergency response and through close liaison with the emergency services. Rapid decisions are needed, unfortunately with little effective back-up from the expert Public Relations staff at corporate HQ - who have many problems of their own.

Stress is taking its toll. The worst case is a true disaster. Elderly people could have received a fatal dose of poison; family and friends who may need treatment must be located before it is too late. The company faces massive damaging publicity and must somehow try to mitigate attacks that it delayed reporting the incident by four potentially life-saving hours. Unhelpfully, this is foremost in the Site Manager's mind when on arrival he asks the Production Manager, somewhat peremptorily, for a briefing. The implications of his tone are clear - Why did the Production Manager permit this state of affairs to develop? Why were checks not made earlier on the local water main? The Production Manager responds cautiously and nervously. The Technical Manager, who by now has worked out exactly what happened, decides to keep quiet. The mistake took place in communications between himself, the water-company and the contractor and as a result a 'tee' was made into the wrong main.

There is definitely a spread of blame, but he resolves not to mention this in the hope of saving his own bacon. Despite having consumed the entire contents of his large flask over the last two hours, he is icy sober and his mind crystal clear.

The first priority is to administer antidote to all potentially affected people. A joint emergency team is established with police, ambulance services and representatives from the local health department. The local retirement home and a street of houses are clearly affected. But the industrial estate could possibly have been contaminated too, and the water main extends to a housing estate some distance away.

The police insist on a major publicity initiative to warn people of the dangers. There is a door-to-door alert, with repeat visits so far as practicable. It is essential to play safe and invite everyone within a certain radius to report to a special assembly and triage centre set up at the local school. Chemist's shops and hospitals are mobilised to supply large quantities of the antidote - fortunately readily available. A massive community programme has now only six hours to treat over 3000 people. - an enormous challenge. Local community groups are mobilised. Old people and children - and then all-comers - are taken to hospital by a shuttle of ambulances, buses and

taxis. Others attend doctor's surgeries, maternity clinics. Every relevant local facility that can be mobilised is called into play, including the rugby club and the scouts. Some half dozen people who had visited the retirement home have still not yet been contacted. The police issue a nation-wide alert, incorporating SOS intermissions on all principal media programmes. Rail Co. is seeking the family on the train.

Management of external perceptions

The HQ emergency team is leading on the management of external perceptions. Key members are mixed up in rush-hour traffic and take more than an hour to respond. Most are in place by 18.00, but too late to achieve a constructive press release before the BBC1 news. According to procedure, they have responsibility for informing the MD. They are beaten to it by his wife, who sees the 18.00 news and phones to break his meeting at a hotel in the North of England.

The Biocides HR manager, who happens to know the plant well, steps in to meet immediate press queries until the HQ press office is established. He has made a timely press release at 17.45, based partly on fast-facts information. Unfortunately some of his facts are out of date. He reports that the plant adds an emetic to the biocide, thereby ensuring that it unlikely to remain in the system long enough to be absorbed. This is true. But the leak took place from a vessel containing material which had not yet been emeticised. The press reports are hence misleading - Again!

After the 18.00 news, the site switchboard is bombarded with calls from anxious relatives. A call divert is established to HQ, to deal with all queries; but the link is overloaded and fails to work. A police response line is also set up to help answer questions. The busy site team assigns the Technical Manager to brief the police representative, not the best choice, since his clarity of mind - sharpened by adrenaline an hour ago - is now crumbling under anxiety and accumulating guilt.

An off-shift control room operator has an elderly father at the retirement home. He gives a statement to the press at the home, saying "*the site*

knew about the problem before lunch because the canteen water was contaminated - and management brought in clean water and pizzas so staff could keep on working - but didn't bother to warn people like his dear old dad, who is very frail and now faces hospitalisation and perhaps worse".

The MD has a major decision point. The initiative is being lost. Company management of public enquiries is overloaded and flustered; it must be strengthened. Attempts to keep the media profile low have failed due to the dirth of other news, plus the need for the police and emergency services to harness the media anyway to find some people on travel who may be poisoned. A nation-wide alert has been made for such individuals to report to their nearest hospital for treatment; and the hospitals themselves must be alerted and briefed. The one saving grace is that the press do not seem to know what the treatment is or how it is administered. The MD suppresses a wince at the thought. He decides that he must visit the site and make a personal statement of regret and commitment to the community. He arrives by helicopter a few miles away from the site at about 20.30 - just in time for the 9 o'clock news.

The streets surrounding the site are in pandemonium. Some people, emerging from their treatment, are clearly very angry and are expressing in eloquent and vivid terms the details of their ordeal to the avid press. This press conference is going to be a challenge.

The emergency waxes into the night. The deadline for treatment is midnight. By then, all known issues of poisoning have been dealt with. There remains an agonising wait over the next two to three days for anyone to develop the early signs of "Bugsplat" poisoning.

The operational phase of the emergency is drawing to a conclusion and the recovery phase - salvaging reputation with the public, the media and the industry, bracing for litigation, paying compensation, and so on, is just beginning to unfold. The scenario continues but for the purposes of this paper we can thankfully draw to a close.

3 Summing up

In summing up the nature of the unlevel playing field occupied by the luckless management of Responsible Care Chemicals when the full implications of the crisis are finally grasped by line management, (at plant level soon after 16.30 and at Corporate HQ over one hour later), we note that:

The diffracted team is hobbled by the effects of surprise (the unexpected) and consequent shock; warning systems have failed to function; there has been manifest initial failure to recognise key features (is it really a crisis?); there is, understandably, an uneven reaction as response gets into gear, aggravated by delayed shock when the full gravity sinks in too late; no forward-looking perception - back to the past, plus reflexive reaction to present; in short they are off to a difficult start.

Prepared systems have not served; there is continued management fragmentation and dissipation, with risk of confusion and conflict, leading to inadequate improvisation - smacking in aggregate of too little too late; the impression is given of a large unwieldy machine:

there is inadequate information management and presentation; failure to integrate a range of scattered, disparate information; extemporised flight into unanimity around an unsound course of action; inability to generate future perspective; critically late diagnosis, accompanied by failure to settle either situation or direction until very late;

protection systems and immediate response procedures are less effective than planned, there is malfunction of (inadequate) call-out systems; the organisational structure is unequal to circumstances and is unable to settle into effective operational system; under this sort of pressure the crisis is unlikely to be resolved satisfactorily;

vulnerable individuals, destabilised by events, worn by stress (they may be tired already), have unpredictable reactions and peaks and troughs in their performance over time; and

the legacy of the poor start with internal communications leads to late and inept initial briefing to the MD, media, emergency services,

local authorities and, shortly, the Health and Safety Executive (HSE).

The company is liable, now, to mismanage the whole high-level issue in the eyes of concerned/involved external authorities: partners, HSE, Government, the commercial world at large - not to speak of the broad arbitration of public perceptions. This will be a truly diverting story on an otherwise slow night for news.

The challenges facing the ongoing management of this crisis are formidable. The old joke of asking an Irishman for directions (my family is Irish!) and the answer "well, I wouldn't start from here" springs to mind. Were Responsible Care Chemicals unlucky? In answer I would conclude with an aphorism for Luck.

Luck is where preparation meets opportunity.

(This paper is adapted from a detailed crisis scenario, prepared by OCTO for advising senior managers in major hazard industries on crisis management.)