6  Fire Commander

Dennis Davis
HM Chief Inspector of Fire Services, Scotland

Dennis Davis became a firefighter in 1965 at the age of 18, joining the Walsall County Borough Fire Brigade, where he progressed to the rank of Sub-Officer. He joined Cheshire Fire Brigade as a Station Officer in 1971 and moved through the ranks of that brigade to become Deputy Chief Officer in 1983 and subsequently Chief Fire Officer in 1986. Because of the risk profile of the county of Cheshire he gained significant experience of command at major petrochemical incidents and fires.

He is a Chartered Engineer, a Life Fellow and Past President of the Institution of Fire Engineers and its current Management Committee Chairman. He has also served as President of the Chief and Assistant Chief Fire Officers’ Association (CACFOA) and was for several years Chairman of that Association’s Emergency Planning Committee. He was appointed to his present position in May 1999.

Introduction

It was a pleasant February evening, which had begun with dinner for six at a local restaurant. Unfortunately, as so often happens in any fire brigade commander’s life, the sounding of my paging unit at just after 8.45 p.m. was to disrupt this happy scene alerting me to the fact that a local major chemical company was experiencing a fire.

Having been with the Cheshire Fire Brigade for over 20 years, in an area holding one of the largest conglomerations of petro-chemical industries in the country, such calls were no surprise. I had, after all, attended many major chemical plant incidents, and having been heavily involved in the Staff Department, had spent quite some time working with the industry pre-planning and designing chemical emergency response procedures like the one called ‘Cloudburst’ which was now swinging into action.

So, nothing too unusual for a firefighter about a disrupted meal or a call to a major chemical manufacturer’s site. However, as the first appliances on the predetermined attendance started to respond, circumstances dictated an event that was to ultimately reach national proportions, with calls for a Public Inquiry and media representatives who scented a disaster had been avoided more by good fortune than cohesive response. It was an accepted fact of life in Cheshire that when incidents of this type occurred there would be considerable press interest. Major television and radio stations were serving around 10 million people in the adjacent area. There was also an underlying safety concern, about such petrochemical installations, amongst the public. Managing those legitimate interests was always a pressure on the Incident Commander. Such a background naturally made any fire brigade commander alert to the public consequences of toxic material escapes and to the fact that the public often had a perception of a higher risk than was the reality.

The Incident

The fire that occurred and had called for the initiation of the major response procedure referred to as Cloudburst was at the premises of Associated Octel, situated at Oil Sites Road, Ellesmere Port, Cheshire. Subsequently, although this of course was not known at the time, this incident was to become serious enough to be reviewed and appraised by the Health and Safety Executive following a number of concerns raised by residents.

The published report (HSE, 1996) of the incident which occurred on the 1st and 2nd of February 1994 provides a great deal of detail about the incident. This will not be covered in this chapter, which concentrates more upon the decision processes used by various commanders as the incident progressed.

It is, however, worth mentioning that this 87 acre site in north west Cheshire is just over 1.5 km from the populated area of the town of Ellesmere Port and borders on its northern side the Manchester Ship Canal and River Mersey. The site itself is very much a part of the Stanlow industrial complex of oil and petro-chemical manufacturing sites. The whole site is important to petroleum production since manufactured on-site are tetraethyl and tetramethyl lead used as anti-knock compounds in engine fuel. As such it affects the production of all other motor fuels, there being
no other similar site in the UK. Something else for the firefighter to think about are the sodium and chlorination plants, also present on-site with their attendant risks. The company therefore operate a notified major hazard site presenting the hazard to the wider environment, as described within UK regulations derived from the European ‘Seveso’ Directive, which arose after dioxine escaped into the Italian countryside with devastating consequences in July 1976 (see HSE, 1999).

The Hazard

The initial call had been made as a result of a leak of ethyl chloride. This was both serious on-site and had the possibility of affecting premises and the public off-site. The wind speed and direction indicated was twelve to fourteen knots from a westerly direction. This provided sufficient information to enable a joint Emergency Services Reinforcement Base (ESRB) to be established at Ellesmere Port Fire Station.

To understand the following account of the management of the incident, it should be noted that the structure of the Cloudburst command procedure included both an on-site, Works Emergency Headquarters, and off-site emergency centre, the ESRB, to be in operation for this sort of incident. This directly impacts on the decision process that is used. The objective of having these two centres is to reduce actual attendance levels on-site, so lowering the number of persons at risk, allow briefing of firefighters to occur before they enter the risk area, and move logistical support away from the active operational zone. The overall Incident Commander operates from the ESRB.

The Operation

Returning to the initial incident, the fire service Station Officer on arrival established an on-site command centre at the Works Emergency Headquarters and a Forward Control point close to the actual incident. He then committed four firefighters dressed in breathing apparatus and chemical protection suits to position water ground monitors, so adding to one ground monitor already positioned by the works fire brigade, to form a water curtain. This effectively gave three water sprays that were used to disperse the gas cloud that was emanating from the spilt products.

Unfortunately, at the time, one of the key pieces of information not known to the on-site Station Officer was that the product was highly flammable. The information he was using at the time had been gained during earlier pre-planning risk assessments using inspection processes common to all UK Brigades. Information obtained from these pre-incident visits conducted under risk inspection procedures was then carried on appliances in paper form. This information was on arrival with shift staff. It suggested that the real hazard from the leaking product was a toxic one created by the evolving hydrochloric acid gas. It was this gas that he was seeking to disperse.

With these initial procedures in operation, the brigade Fire Control mobilised, in accordance with the Cloudburst procedure, further sufficient pumping appliances to the ESRB to enable an ongoing operation to be conducted at the site. This response in one way also reflected a health warning gained from previous experience since incidents of this type frequently suffer from the simple difficulty of accurate information transfer. Misinformation can often start with the company getting the wind direction wrong for the turnout message – not insignificant if you are responding to a toxic release and coming at it in the hazard direction because of a basic error. Confirmation of basic information was therefore the natural first action and in this case support was already available through the attendance of the on-site fire service.

Shortly after the fire brigade’s arrival one works employee had been conveyed to hospital suffering the effects of fumes. This tended to reinforce the view that a major toxic risk existed. It therefore appeared appropriate to continue the operation as initiated with water sprays whilst decontaminating the various firefighters who became involved as the operation progressed.

On-site Communications

On-site, communication to the Works Emergency Headquarters and thence to the ESRB were set up and at the ESRB, further links to the District Off-site Emergency Centre (DOSEC) were established. The DOSEC was responsible for co-ordinating local authority responses should the incident progress and again are part of the established Cloudburst emergency plan. Having the DOSEC remotely located also ensured the ESRB was free of all but essential emergency response staff and media representation. That
helped avoid not only distraction but also aided concentration on the key issue of the incident.

**Escalation**

The Station Officer had, by 9.15 p.m. been supported by an Assistant Divisional Officer who had taken charge of the incident and increased the pumping appliances on-site to six. This facilitated the support by additional firefighting resources in the terms of water monitors whilst deploying additional breathing apparatus wearers.

Off-site, monitoring was being conducted in accordance with standard procedures and adjacent industrial sites had been alerted to the operation. At around 9.30 p.m. pumps were again increased to eight to allow a foam blanket to be placed over the leaking product. Those officers in attendance working with company staff had also estimated that some five tons of ethyl chloride had leaked and was now evolving hydrochloric acid gas. In order to place the foam blanket, the use of the water monitors was discontinued. Again this is often standard practice since the water curtain would nullify the effectiveness of the foam by making it unstable and even transferring it to another part of the site. Losing cover in this way can present problems; the gas evolution can temporarily increase placing those close in, at risk and requires a degree of technique if it is to be successful. This is therefore a tense time for those involved and one action not taken lightly even though it is routine. The incident commander has to be both alert to these possibilities and have good overall co-ordination with site managers as the change in tactics unfolds.

It is worth noting that during this period of the operation, works personnel with firefighters had entered the leak area in an attempt to both identify the source of the leak and isolate it if at all possible. In recognition of what was a developing incident, various officers of command rank had subsequently attended the incident, either at the Work’s Emergency Headquarters or Forward Control, so replacing various officers who were assuming command of their part of the incident. All this activity, in command turnover, took place in less than one hour of incident duration. There is always some risk that in handover factual information is lost as task priorities impact upon individuals working at high personal stress levels.

**Getting the Facts Right**

The most critical aspect of this change of command was that whilst attempting to reduce the off-site impact, using water spray curtains, little had been known of the highly flammable nature of the original leaking product. The crude ethyl chloride reactor liquor that was involved was approximately 90–95% ethyl chloride with up to 2% hydrogen chloride. The main hazard was ethyl chloride although the hydrogen chloride is toxic and corrosive readily forming hydrochloric acid mist on contact with moisture. The ethyl chloride is primarily a flammable risk and, although its boiling point is close to normal ambient temperature, it is generally handled as a liquefied flammable gas when it is in its liquid form. When ethyl chloride burns, it produces toxic fumes as part of the combustion process and a pool fire would both produce high thermal radiation and toxic fumes. This information was not, however, either available from technical information on-site with the fire-fighters or offered by the technical staff available at the incident at that time.

The difficulty for the initial fire service incident commander was that he was unaware that this was the primary hazard. A very important point, when it is realised that it was the flammable gas alarms sounding at around 8.20 p.m. that alerted the works to the leak on the ethyl chloride plant. On arrival the risk information cards and available expertise from the site fire service all suggested a toxic hazard. Gas was moving off-site. A visible cloud existed. It was large and increasing. Activity in the company control room was high and, to the uninitiated, confusing. The tactic suggested of deploying a water curtain was confirmed. On the ground the physical effort was demanding in noisy and threatening conditions. Personal protective clothing gets in the way of speech, vision and hearing. The water curtain was in place and now, at the suggestion of company advisers, it was to be replaced with a stable foam blanket. All was going to plan to handle a toxic leak, not a flammable one.

It was with some surprise to those initial personnel on-site then that at just after 10 p.m., the gas cloud ignited with considerable force. The source, as the subsequent Health and Safety Executive (HSE) Inquiry revealed, was probably a release at a point between fixed pipework and a discharge port on a pump within the ethyl chloride plant. The HSE concluded that this possibly arose either because of a corroded securing flange or the failure of specially designed bellows although the HSE view was that corrosion was the most likely cause. The subsequent fire was
indeed very severe. It ultimately required a major foam attack involving special procedures for the entire north west of England’s foam stock supported by twelve pumping appliances and the major foam tenders on site.

Brigade Commander’s View

After my own arrival at the ESRB shortly after 9 p.m. I had commenced a review of the site and product details whilst examining the major off-site implications. The confirmed product details held at the ESRB indicated fires could be extinguished with either foam or water and that toxic fumes were evolved in ethyl chloride fires. I had been advised by both the DOSEC and a neighbouring chemical company that gas was indeed going off-site. Pressure was mounting for an urgent decision. The DOSEC wanted to know whether to commence evacuation of the public and the police were very concerned about the risk to motorists on a nearby motorway. They wanted to close this and an adjacent railway. My own view is that if gas is in the air, evacuation is not necessarily the safest or soundest option. Disrupted traffic can sometimes create serious operational difficulties in the very area you are trying to keep clear as drivers experiment with unfamiliar routes. The situation on the ground suggested our original approach of water sprays and no evacuation was a good one and I wanted to press on with the tactic. Effectively this meant re-appraising the DOSEC and police whilst pressing the Works Emergency Headquarters staff for constant up-to-date information.

Then the fire occurred, as described above. My whole plan required re-evaluation. This was a major hazard site. Ethyl chloride was not the sole or major hazard. Other more damaging products were present, not least chlorine which was stored adjacent and now at risk. The almost immediate decision was to attend the site in person. Why? Because key information was required for the next series of decisions I needed to make and I considered actual observation of the visual impact would be critical. It was as it happened that I was the most experienced officer for this type of incident who was available. In the event I curbed this very natural instinct and asked the very experienced Deputy Chief Officer (DCO) to attend in the first instance while I started to put in place, at the ESRB, a chain of command to manage a public evacuation if that became inevitable.

Time is a Pressure

This was a critical time. I believed that storage tanks containing a further thirty tons of ethyl chloride were indeed threatened. These tanks were protected by an intumescent coating, which had been designed to provide protection for around one and a half hours. By 11 p.m. I knew a domino situation could begin if the protection did not hold or the fire destroyed the structural integrity of the vertical steel plant holding the storage vessels. On such a site as this, that could lead to a highly hazardous situation.

It would mean that a critical decision had to be taken at around 11.30 p.m. to commence total evacuation of all firefighting personnel from the site. As mentioned detailed consideration also had to be given to the fact that this was a major hazard site and that within forty metres of the fire was bulk chlorine storage. I could not ‘see’ the visual signs of what was happening only ‘hear’ what was happening, through often restricted official messages.

Seeing is Believing

My eyes were those of my colleagues. I could ask questions, which I did, with increasing levels of detail. What colour are the flames? Exactly how high? Was the foam stable? Did the elevated vessels look secure? Could they see what was happening to the intumescent coating? I was reassured that the major foam attack mounted was holding even though the fire’s intensity was undiminished. To do this an open line telephone link was established for private conversations, but unfortunately those on-site had to keep leaving the phone to fight the fire!

My arrival at the ESRB had coincided with a particularly difficult phase in terms of this communication between the ESRB and the DOSEC. The telephone link had been established as was normal practice but officials within the DOSEC were having difficulty in interpreting some of the more technical issues which were being conveyed to them from the emergency services at the ESRB. Fire service liaison staff had been despatched to help DOSEC staff, but it was apparent that the pressures within the DOSEC were rising as local officials and politicians sought reassurance and guidance as to the need to evacuate the nearby local population.
External Messages

I had concluded at the ESRB that evacuation was not required at this stage, having determined, given the wind direction and exposure risk, that shelter was preferable. The time of day of the incident meant that news broadcasts, including national broadcasts, were now reaching a stage where a great deal of information was being conveyed by the media to the public. This was heightening their fears that something dreadful was about to occur. Naturally a concerned public were then seeking reassurance since they were aware that this major hazard site had the potential to create very real danger to them. Unfortunately the reassurances being made to the media particularly in terms of the control on-site and facts such as wind direction were not being given the same profile as the risk and potential for harm.

This had also given rise to increased concerns regarding the nearby motorway and railway links that were still operative, which again had the potential for placing many people within a close proximity to the major hazard site. As the fire brigade commander I therefore found myself in the centre of a discussion that was more to do with reassurance and communication than tactical or operational decision-making. This at a time when I needed reassurance that the tactical plan was working.

Great reliance also had to be placed upon the company official who had attended the ESRB, although he was finding that a confusing picture was emerging as to what was actually occurring on-site. The consequence, despite further communication to the company site, was that I was finding it hard to draw a perspective on the potential for likely harm or development of the incident.

This lack of a clear outline of how the incident was developing became further confused when the information relating to the intumescent protection provided to the storage facilities arrived at the ESRB. This gave rise to a concern already touched upon that there was a real potential for further loss of containment of the stored materials if the intumescent protection failed.

This information was passed to the DOSEC to give a clear indication that whilst evacuation was not currently required there was a possibility that it might be needed within a time frame of less than one hour. Inevitably this then meant that the DOSEC had to start making preparations for evacuation and the police equally had to consider closure of the nearby motorway and railway links.

Undertaking such operations involves major disruption. Inevitably, the media became aware that the emergency services were preparing for an even worse situation. As already mentioned, the news was going out on a regular basis. Given the situation I had also taken the decision that it would be important to commence closedown operations on adjacent company sites that were also handling major hazard materials. These companies were, therefore, alerted and advised to commence a process that might involve the evacuation of large sectors of their own operations.

Taking this sort of decision cannot be undertaken lightly given both the high economic value of the materials involved and the need for the operations of closure to be taken in a very sequential way to ensure that they are done safely. It is true to say those having to shut down an operation have to trust the judgments of the fire service commander.

Finding a Solution

Whilst these external decisions were being made, further attempts on-site had been made to verify the product’s properties both in terms of its exact state and quantities. This was essential information if any attack was to remain effective and equally to enable assessment of the likely impact of a catastrophic failure of containment. Attempting to assess the impact of the chosen tactics gave rise to the further concern. The foam attack, which had now commenced, was likely to be insufficient to either fully extinguish an open fire or to provide protection for other parts of the affected site which might become involved should a catastrophic failure occur. The adjacent chlorine tanks, for example, required adequate protection since their product could not be discharged safely to other parts of the site or road tankers within the existing time frame.

The decision to continue with a major foam attack also meant that major movement of bulk foam stocks had to commence from the whole of the north west of England. Whilst this was a pre-planned procedure, the logistics to achieve the desired impact effectively involved doubling the resources of appliances and personnel allocated to the incident so doubling the spans of control and command. This was to allow the transfer of stock and to contain it within the tanks of appliances so that it could be moved rapidly on-site if required.

Fresh Assessment

To help in these assessments the DCO, who had proceeded from the ESRB to the on-site works emergency headquarters and then on to the Forward Control position, was able to better inform me as to exactly how the deployment might be achieved. In addition the DCO was able to send first hand information back to the ESRB so that I was in a better-informed position regarding the whole scenario. This now included effective media
management, preparations for evacuation, logistic support for a major foam attack, overall control of information regarding the site and the potential for development, and the formulation of tactical plans designed to bring the whole situation to a safe conclusion. Keeping in touch, moving the plans forward and ensuring the whole process was co-ordinated was my job.

This debate and discussion at the ESRB continued until the critical time period when it was likely that the intumescent insulation might fail. At that stage, sufficient resources had been assembled on-site to commence a major foam attack, which it was hoped would extinguish the main fire and so provide the level of protection to prevent the failure of the storage vessels. This was therefore the point on which the whole operational strategy and tactical plan was to balance.

Look for Yourself

I then made the decision that it was appropriate for me to attend the site so as to better assess the situation and gather at source any further information available to help in determining whether to request the evacuation and shut down of such a large area. In moving to the site from the ESRB, I had ensured that the necessary logistics officers were in a position and able to act quickly should there be the decision to alert the other emergency services in the DOSEC to move to the evacuation phase.

Arrival on-site confirmed that there was indeed a serious situation. The positioning of major foam monitors and cannon had commenced with the DCO now in charge of launching the attack. I made some minor adjustments to the attack plan and the foam attack was then launched.

After about fifteen to twenty minutes of this major foam attack I assessed that it had started to achieve its objective and progressively the fire was reduced both in volume and intensity. It was however not possible to extinguish the fire at this stage due to part of the damage that had been sustained to the plant and the fact that the storage facility was elevated above the damaged section. This created a siphoning effect so enabling the fire to keep going for some time. It was my estimate that the severity of risk, particularly to other exposed parts of the plant, was containable now that the major resources of foam and personnel had been assembled.

I remained on-site for some time assessing how this attack was proceeding until satisfied that it would be safe to further advise the other emergency services and DOSEC that it was unlikely that an evacuation would be needed.

It is fair to say that a degree of relief was evident amongst all those involved once it became apparent that the attack had sustained a reduction in fire severity. It was not possible at this stage to estimate how long the fire would continue to burn. The entire emergency operation had to be sustained well into the night and early morning.

So what were the Lessons for the Fire Brigade Commander?

- Information is Critical to Success.

Clearly, there was inadequate and ambiguous information about the nature of the hazards, which affected the appropriateness of the response that the fire brigade was going to make. The brigade, had it had access to its own information sources of some detail, may have been able to verify the information that was given to it. Use of the fire service's primary chemical hazard information source, the emergency action code, was not helpful, giving only the protective clothing and evacuation requirement not the primary flammable hazard. Each of the successive fire service commanders on-site had been able to speak to very well informed company officials. It was probably understandable that each should take the information that was offered at its face value, as being the best practical information upon which to base operational tactics: Even where those tactics involved placing personnel within an extremely hazardous area.

- Risk Assessment is Essential.

Again, and this incident it must be remembered precedes the current fire service methods of dynamic risk assessment (Home Office, 1999; HSE 1998, and see Arbuthnot; Crichton & Flin this volume), the risk assessment that was actually taken was more linked to trying to prevent an off-site incident than to contain the on-site effect. Cloudburst itself is a plan brought into operation by any incident, where there is primarily an off-site toxic hazard risk. Initiating the plan again had the impact of directing attention towards a toxic risk when the main hazard as we now know so well was a flammable one.

- Pre-planning is Necessary for Success.

The fire service is not necessarily in the position of holding or retrieving the sort of information that a multi-risk complex chemical site like Associated Octel requires. The procedural operational arrangements for such incidents did work and followed their prescribed form. A Forward Control, Works Emergency Headquarters, an Emergency Service
Reinforcement Base and a District Off Site Emergency Centre were all established.

- Delegating Must be Effective.

As the brigade commander I found myself in a position of having to support these four working centres whilst trying to maintain a strategic overview of the developing scenario. The risks and considerations that had to be balanced were the resources deployed on-site, the protection of on-site facilities, the threat on-site to other facilities and the threat from the on-site incident to the community off-site (which included other complex chemical and populated areas and a series of other queries relating to movement on motorways, railway links and environmental concerns arising from airborne and surface pollution).

- Communications Must be Robust.

The scenarios unravelling themselves on-site were moving extremely quickly. Within one hour the incident had escalated from a flange leak to a major spill to an ignited fire. Within a further hour it had threatened to involve significantly greater storage and indeed much wider toxic risks. The decision processes required strong communication links between all the working centres and the source of primary information about the hazard, the company.

- Balance Skills and Judgement with Needs.

Working as the Brigade Commander I sought to exercise the command process from the emergency services’ reinforcement base (ESRB). Given the scenarios that were emerging, I then found it necessary to attend the site to assess for myself the likelihood of success of the major foam attack when it was launched at around 11.30 p.m. Was I right to move to this location at that time?

Hindsight suggests that it was the right decision, given the critical decision required – to evacuate or not – since this was the only location from where it was possible to make the final assessment. The management of the ESRB could be left in very capable hands so my departure from accepted practice felt safe and offered the right personal balance of responsibility and accessibility.

- Shelter is Better than Evacuation if you can Achieve it.

Whether or not to order a complete withdrawal of fire brigade and works personnel and issue the major evacuation order for a significant population that included the elderly and the young was a decision of some weight. It was likely to be challenged in court if losses, financial or human, occurred.

- Recognise the Political Requirements.

Equally political pressures would have been immense post incident, had the wrong decision been made. Part of the judgement had to be whether to rely on and so place the responsibility for the decision on more junior officers. Would this have created for them a fairly significant dilemma? After all, are brigade commanders not expected to exercise ultimate operational judgement in the fire service?

- Corporate Liabilities are Real and Have to be Considered.

There is also the dilemma that had the initial decisions of the responding commanders resulted in the death or serious injury of those fire-fighters sent forward on reconnaissance duties, there would have been a Fatal Accident Inquiry. They had acted in good faith and with the information available. Their role of leadership and delegated responsibility placed them in a no win situation, since to ignore the advice on-site and follow another series of tactics required scientific knowledge and chemical process awareness neither they nor I have. I was likewise extremely conscious that undertaking the foam attack would expose fire-fighters to high risk and I wanted to know that my decision was the correct one. So I attended the site; evidence perhaps that we all feel vulnerable. As it was, the Health and Safety Executive Inquiry concentrated upon the incident primarily because of questions raised as a direct result of public concerns.

The Health and Safety Executive did subsequently prosecute the company and on the 2nd February two years after the original incident, contraventions under the Health and Safety at Work etc Act (1974) were found proven, the company having put at risk the health and safety of employees and other people, in particular the fire-fighters involved. A fine of £150,000 was levied together with costs of £142,655.

- Professional Judgement is Critical.

There is little doubt; the fire service commander played a critical role in the decision processes of this incident. A poor tactical decision had been made
Initially, due to an information failure. Had the right information been available, it is possible that the fire might not have occurred, although this must remain conjecture. Once the fire had occurred, again, information became critical in forming assessments of how the situation was likely to develop. Upon those decisions were based not just issues of safety but also health and environment. Throughout the incident, fire service commanders at various levels were attempting to mitigate a leak and control the fire. Their decisions were economically important and safety critical. Ultimately, there was little off-site damage. Likewise, on-site the strategy and tactics resulted in good effective control which prevented spread with little damage occurring other than to the affected plant.

- **Personal Protection is Essential.**

The classic dilemma therefore, arose for the fire-fighter to stay and fight the fire in what was a hazardous situation or to move further away reducing personal risk but perhaps heightening the risk of spread. All actions, which could be taken to mitigate personal risk to fire-fighters, were taken. Clearly the wearing of personal protective equipment was mandatory, so also was the use of equipment which enabled covering jets and ultimately foam monitors to be used semi remotely thereby reducing personal risk.

- **Recognise the Impact of Stress.**

All of these considerations were made in stressful situations in incident centres where noise from various communications were incessant and where questions were constantly being asked which required urgent if not immediate responses.

- **Know Your Operating Environment.**

At the incident scene, the noise of the leak and the fire, with the roar of the pumps and the monitors in the dark of a February evening provided its own external environment of pressure and stress. The nature of major complex chemical sites is that those who are not used to that operating environment feel threatened simply because of the noises of the manufacturing processes. Any minor variation in the background noise is, therefore, carefully listened to when a major incident is in progress.

- **Listen – Watch and Learn.**

You find at incidents like these that you have to attempt to recognise whether this or that new noise or change in flame or depth of mist or gas is an indicator of a change in chemical process that may be presenting a higher magnitude of risk to colleagues.

- **Analyse Everything Available.**

Remaining calm, analysing data, deploying resources, measuring effectiveness of firefighting actions under such circumstances is the textbook response. Skill, combined hopefully with good information, and sound-working practices also helps! Incidents such as the one described indicate that, on occasions, a bit of luck can also be a major component in avoiding further injury. There is often a blind side during incident command situations and eradicating that blindness, is helped by transferred information, knowledge and experience.

- **Learn Each New Lesson.**

One has to ask whether, given current technologies and approaches, a better decision process can be introduced which minimises these risks and helps to avoid placing the fire service commander in such circumstances. This becomes all the more relevant as opportunities to experience large or complicated incidents reduce. My own development benefited from a number of these types of incident where I was led by people who had dealt with similar situations before. They helped ensure my own knowledge was improved whilst I gained confidence and a healthy respect for the chemical industry. I hope this note assists in that learning process.

This incident reinforces the need to:

- **Check and use all sources of information. Never assume;**

- **Develop an objective and professionally sound operational plan. Stick to it unless the objectives change; and**

- **Don't be afraid to vary a procedure if that improves the likelihood of success or enables better decisions to be made.**
References