

THE POTENTIAL IMPLICATIONS of COMAH with respect to EMERGENCY PLANNING

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The current requirements of CIMAH with respect to emergency planning are outlined and the likely requirements under COMAH outlined. Effective emergency warning systems are considered and the merits of currently available systems shown with reference to a particular area of the UK. The testing of site emergency plans is likely to be a future requirement. Difficulties may be encountered in carrying out a meaningful test though there are many lessons which may be learned which can be of great value in the event of an incident.

The major leak of dioxins from the Icmesa plant in Seveso in 1976 gave rise in the fullness of time to the EC Directive number 82/501/EEC, known colloquially as the Seveso Directive. The provisions of this Directive were implemented into UK legislation in the Control of Industrial Major Accident Hazards Regulations 1984 (SI 1984, 1902)(CIMAH) and since amended. The initial Directive, itself now twice amended, was unsatisfactory in certain areas. Some of these are the large number of named substances, the distinction between material in process and in storage, the lack of defined duties relating to emergency planning and the provision of information to the public off-site.

With the current Presidency of the European Union now having formally addressed this matter there is to be a further Directive in due course. This Directive is currently in a draft form and entitled " Proposals for a Council Directive on the Control of Major Accident Hazards Involving Dangerous Substances"⁽¹⁾. The progressing of this draft to common position and its ultimate adoption by Member States is seen as a priority item on the Union agenda. It is envisaged that the proposal would ultimately be given the force of law in the UK by the introduction of the Control of Major Accident Hazards Regulations - COMAH.

For emergency planning purposes, the current CIMAH Regulations require that a number of duties are undertaken by both the occupier of the site and by the local authority in whose geographical area the site is situated. These duties are such that

- the site occupier prepares an adequate on-site emergency plan which is kept up-to-date and takes into account material changes.
- the local authority prepares and keeps up-to-date an adequate off-site emergency plan after consulting the manufacturer and the Health and safety Executive (HSE).

- the site occupier keeps the public informed about certain measures (which are specified in a Schedule to the Regulations).

There is no duty under these Regulations to test the adequacy of the emergency plans. Neither is there a specific requirement to alert the public off-site that an emergency is imminent or indeed is actually taking place.

The envisaged COMAH Directive is likely to address these points. If adopted, Article 11 of the proposal would require member states to ensure that both on-site and off-site emergency plans are prepared and that these plans are implemented without delay if a major accident were to occur. The objectives of these plans would be

- the containment and control of incidents so as to limit their effects and damage
- the implementation of response measures to protect both persons and the environment from these effects
- the communication of relevant information to the public and other services or authorities
- the provision of restoration and clean-up plans to restore the environment after an incident

The Article also requires that testing of emergency plans is undertaken on top of the requirement for reviewing (every 3 years) and updating which currently exists. It will also give the public the right to be involved in the preparation of the off-site emergency plans.

Article 8 also requires the consideration of domino effects and will require that groups of establishments exchange information between themselves to take account of the overall major accident hazard. The first of these requirements has cross-border implications likely to be of less consequence in the UK than in other member states, but the second will involve certain areas of the UK where there are a number of sites in reasonable close proximity to each other. One of these areas is the south bank of the river Severn to the north west of Bristol between Avonmouth and the Severn bridge: this area will be referred to later.

The exact meaning of the phrase "communication of relevant information" and whether it is intended to require the provision of a warning system is no doubt one which is a matter for legal interpretation. But certainly, to test an emergency plan with any degree of realism would obviously require that an alarm system was in place. The warning of persons on-site is generally accomplished by siren, announcement by public address system or personal radio. Off-site warnings may be expected to be given by sirens, by radio/television or telephone messages or by some form of public address system. The effectiveness of a warning is most obviously demonstrated by the ability of the warning system to provide the persons exposed to the risk with sufficient time in which to take some form of predetermined action to mitigate the potential hazard. A bicycle, a football rattle and a Special Constable crying "Gas!, Gas!, Gas!" was firstly only effective over a limited area and secondly only effective at all because the threat was well understood by everyone (as a result of an intensive education programme) and perceived as a threat against the entire population.

Warning systems have been studied for effectiveness by a number of authors⁽²⁾⁽³⁾⁽⁴⁾ and their conclusions have been used in attempts to design warning systems which actually do warn. It is not the time taken to warn people which measures warning system effectiveness but the time with respect to the materialisation of the hazard. Where there is a lead time of some hours there is some evidence⁽²⁾ that almost all of the population which is at risk can be effectively warned without the need for highly complex and specialist equipment. A sufficiently timely off-site warning is generally less readily achieved because of the limited time available in which to act. A warning should be of such character that persons who may be imperilled and who may be able, and know how, to take palliative action are made aware that there may be an emergency. This obviously requires that there should be an appropriate degree of prior instruction or education relating to the action intended to be taken in the event of emergency, even in the case where the emergency warning can be used as the vehicle for giving instructions themselves. There is little point in warning those for whom no action may be possible (for lack of time or in some circumstance where no action would be likely to lead to a diminution of danger) or those who are so remote from the point of the emergency that the risk of harm approaches a level which is vanishingly small. Nor is there any great value in warning those who have no inkling of what the warning may presage. This implies that for a prolonged toxic release, a scenario which gives the warning system the greatest chances of success, the distance over which the warning should be given may in practice run to tens of kilometres in length.

One system which appears to have the potential to be both effective and efficient is a suitably designed siren-based system, such as that proposed⁽⁵⁾ for the Avonmouth area of the UK. This system comprises a number of high efficiency sirens - basically loudspeakers - mounted at strategic points within an area and able to be activated from a central control point. The sirens are to be sited at points identified by an acoustic survey as being those points from which the greatest coverage may be achieved. The sirens will be activated on receipt of a signal, by radio or land-line link, which is microprocessor controlled. This allows individual sirens or numbers of sirens to be activated sequentially or on an area basis, making possible the operation of some sirens preferentially over others. This would be a valuable feature in the event of, for example, a toxic release, where the area at risk would be dependent upon weather conditions. When activated the sirens produce a tone or series of tones at 130 dB and are likely to be heard for some distance. It is planned that the authority to sound a warning will be invested in all the emergency services though the control room itself will be under the supervision of the police.

A performance criterion has been devised for the system which requires that each siren should be capable of warning 75% of the population within a given radius. Sirens are to be installed in accordance with this criterion to give maximum economical coverage whilst aiming to ensure that all residences and places of work will be covered. The initial installation phase of this system is expected to begin shortly with commissioning in autumn of 1995. The system is adaptable and capable of being extended to cover a larger area with proportionally less cost, as much of the initial expense is incurred by the installation and testing of the control room and operating systems. An extensive education programme is also being implemented, with local schools and community groups being heavily involved and committed. The arrangements are intended to cover, for example, specific sections of the community such as those persons who are known to be hard of hearing. The local authority are also proposing the

introduction and local distribution of an annual calendar which will bring all the necessary information into an easily available format, whilst an annual exercise will reinforce the message to the public.

A system such as this, which is based on modern electronic loudspeaker sirens, has significant advantages over systems employing older electromechanical or pneumatic sirens. One advantage of this system, or any similar system intended to cover a number of more or less contiguous sites in a defined geographical area, is that there is the capability either to produce a different signal tone in different areas (to avoid confusion with existing sources of noise) or to generate a standard tone which can be understood by all without ambiguity. Additional advantages include a larger coverage, the ability of self diagnostics to be incorporated into the design for testing purposes, possible multiple toning and the use of the system to broadcast as a public address system. The capability of the warning system to convey a complex message in intelligible text should be weighed against the ability of site personnel or the public to comprehend and understand that message and take effective action as a result of it. There is evidence⁽⁶⁾ that the response of the public to an intelligent message would not be panic and mayhem but is likely to be such that the use of such a message would be regarded in hindsight as justifiable. Conversely, if information is provided prior to the event through, for example, mail shots, then in the event of emergency only a relatively small proportion of persons may be expected to respond in accordance with these prior instructions⁽⁷⁾, many having forgotten their content or even their existence.

The envisaged requirements of COMAH will not define specifications or performance standards for alarm systems but do include provision for the mandatory testing of emergency plans at defined intervals of time. On site, this will require training of all personnel, particularly those who will be expected to carry responsibility in the event of emergency. It will also require rehearsal of the actions to be taken in an emergency situation. Table-top exercises are reasonably easy to set up and their value as a learning tool should not be underestimated. They enable lacunae in the organisational arrangements to be pointed out and thereby allow site management to address them at some convenient time. Common software failings which may be found are the lack of comprehensible arrangements for initiating emergency action in the first place - who is authorised to sound the emergency warning? - and the inability of the personnel to adhere to the plan because it has not been kept up to date with, for example, changes in staffing and personnel movement on site. It is often the case that too much is expected of individual site personnel, for example the (possibly) inexperienced security guard who may have to cope with a sudden massive increase in traffic flow with limited, or even contradictory, sets of instructions to help him. In hardware terms it is invariably communication problems which create the most difficulties, either by systems failing to work for whatever reason or, commonly, becoming saturated by the level of traffic to which they are subjected.

The official HSE report⁽⁸⁾ following the fire at Allied Colloids on 21 July 1992 found that in this instance there was a site siren but that there had been delays in its employment which meant that members of the public were not alerted as soon as perhaps they might have been. The emergency services which were in charge of managing the emergency did not have the authority to order the siren to be sounded. When it had been finally sounded, it was prematurely cut off when the site power supply was isolated. The HSE report recommended

that agreement be reached at all major hazard sites between the occupier and the emergency services on the circumstances in which the alarm can be sounded and who can order its operation. This procedure should be written into the emergency plans. The safety report or safety case for the site would be the obvious repository for information intended to demonstrate that the emergency plan is sound and that the materiel to be employed is of a sufficiently high standard.

The full-scale testing of an emergency plan is an experiment not to be undertaken lightly and will incur considerable expense in terms of both money and time. The defrayment or recovery of the cost of the attendance of the emergency services in a full-scale simulation test is one item not addressed in the proposed new Directive. To minimise the cost would be one objective, but of course the maximisation of returns would be an equally valid aim. The maximisation of learning for the minimum of cost is a matter which can only be effectively addressed by full and complete liaison between the emergency services, the local authorities and the management of the site where the testing is to take place.

There is also the role of the public to be defined in the testing scheme. The proposal as currently drafted indicates the imperative, that the public will be involved in the testing and preparation of off-site emergency plans. Aside from the difficulty which would arise if the public chose not to become involved, either through ignorance or apathy, their envisaged role is not clear. Certainly, depending upon chance, there may well be a number of extremely well informed persons who are included in "the public" and there could as easily be those versed in emergency planning or with other specialist skills which might be of considerable value. It would be an ineffective use of this resource if the public were merely employed as miscellaneous mock casualties in a preplanned exercise. The public information zone around the hazardous installation defines the area within which there is communication from the site to the public by whatever means is decided to be effective. Possibly this means could also be used to identify to the site those members of the public who could make a positive input into the emergency plan. There could well be a mutual interest group which could provide an ideal focus of attention for interested parties.

The message to industry is a clear one. There is no doubt that the European Union are determined to progress the draft Directive to a conclusion and the timescale which is hinted at is extremely short in comparison to the time which such processes may take. Ultimately there will need to be changes in relevant legislation and there will be a greater or lesser period of time in which those affected will need to make the changes and arrangements necessary to achieve compliance. The emergency planning arrangements which are likely to be required as a result of the new legislation will demand that additional resources and greater attention are given to this aspect than has sometimes been seen in practice. These arrangements are going to involve not only individual sites but possibly their neighbours and not only the local authorities but the public. For sites which are going to be affected by the changes therefore it would be prudent, if not essential, to begin the processes of consultation, discussion and organisation of amended emergency planning arrangements without delay. After all, a disaster may occur only once in a thousand years, but it might be tomorrow.

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