

"DEMONSTRATION" UNDER COMAH – PROBLEMS AND PARTNERSHIP.

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The introduction of the COMAH (SEVESO II) regulations into the UK has proved a major undertaking both for the companies required to write new Safety Reports and for the regulators who are required to assess them. The regulations introduce a number of new requirements but one has proved particularly troublesome to both regulated and regulator - the concept of "demonstration".

Although the Competent Authority (HSE, SEPA and EA) were able to offer some assistance with what was to be expected in the "demonstration of safe operation" by an operator, the concept has proved difficult for many. The CA have been refining their ideas in the light of the first submissions and operators have been trying to decide both how to demonstrate safe operation and what level of detail is required in the Safety Report to make it acceptable to the CA.

To answer this problem the UK Chemical Industries Association (CIA) and the CA ran a joint workshop in March 2001 to produce four worked examples of demonstration. The aim of the workshop was to produce a consensus view of what constitutes an acceptable demonstration, both to operators and to the CA. The demonstrations were to be made available to operators to help them in writing Safety Reports and were to be used by the regulators as examples of acceptable practice.

In the event it did not prove possible to write the demonstrations in the time available. Consensus was reached on a number of points which it was agreed were required, but on other matters, operators and the CA were not able to agree the level of detail which it is reasonable to require in a Safety Report. The conclusions of the four working groups at the workshop are being collated and are discussed here. They will be jointly published by HSE and CIA and will be available by the time of the Hazards XVI conference.

This rest of the paper discusses some problems operators have been having with the COMAH Regulations. It also discusses the problems operators have encountered in writing COMAH safety reports, especially the "demonstration" of safe operation, and the ways the regulators have worked with operators to overcome these problems.

COMAH, Demonstration, Safety Reports

BACKGROUND

The UK transposed the European Union's SEVESO II directive into domestic law as the COMAH – Control of Major Accident Hazards – Regulations (1999). HSE was intimately involved throughout the negotiations on the new directive and had a major hand in giving them their final shape. At both UK and EU levels, the new regulations were intended to produce a significant change in the way major hazard sites were regulated. All the major EU players, from the European Parliament to the EU Major Hazards Bureau, have made their mark on the regulations or their implementation. In the UK the introduction of the new regulations has seen the formation of a new Competent Authority (CA) made up jointly of the HSE and EA (HSE and SEPA in Scotland) and the recruitment of additional regulatory staff. The UK regulators have made no secret that they are looking to the new regulations to produce new ways of working – both by the regulators and by operators – with greater openness, especially to the public.

Sadly, the period since the regulations came into force has seen a marked change in the relationship between many UK chemical companies and their regulators, especially HSE. The change has not been for the better. Operators have found the new regulations difficult to implement and very onerous in both cash costs and in internal resource. Most operators have - however unfairly - felt the attitude of HSE (as the lead regulator in the CA) to be unhelpful and confrontational. To their credit, the regulators have recognised this concern and taken action to improve the way they are handling relationships with operators. Most especially, as this paper describes, they have co-operated with a team formed by the CIA (UK Chemical Industries Association) to try to answer one of the areas of difficulty, that of "demonstration" of safe operation (the duty placed on operators under Schedule 4, part 1 of the regulations).

PROBLEMS WITH COMAH INTRODUCTION

Traditionally, operators of major chemical sites in the UK have had open co-operative relationships with HSE, though always with a recognition that HSE was prepared to take enforcement action, including prosecution, when it was justified. In the past there has been a recognition of the expertise available on both sides and a willingness to learn from each other. HSE and EA have both been prepared to listen to industry's concerns and ensure that (where legally and politically possible) their guidance reflected what could be achieved as well as what was desirable. Since the introduction of COMAH, many companies feel that Inspectors' attitudes have undergone a marked change, away from the co-operative attitudes of the past to a more rule bound approach.

This change in relationships can be attributed to a number of things but in our view three stand out: the introduction of charging; the sharp increase in the Consultation Distance (CD) around many sites; and the problems of understanding what the regulators want in a Safety Report, especially how the requirement to "demonstrate … adequate safety and reliability" (COMAH regulations, schedule 4 paragraph 3) can be met. Both charging and site CDs are being discussed elsewhere and will not be discussed at length. However, in this context, they cannot be ignored.

CHARGING FOR INSPECTION AND SAFETY REPORT ASSESSMENT

Charging (at a very high rate) was an explicitly political decision, taken at a high level in government. The decision will not be changed but there is no doubt that charging is viewed with unhappiness by the chemical industry and has a damaged relationships with the regulators. It is not just the cost, though that does hurt. Part of the problem is the unpredictability of the non-negotiable charges which can be incurred in any given year. There is also a very wide suspicion that the regulators' activities have been distorted to focus on activities which can be charged for. Many "simple" accidents have somehow become COMAH related whilst others seem to be ignored. HSE inspectors looking at their watches and saying "Well the next section of my visit is chargeable" does not encourage frank detailed, open discussions. In one case, HSE inspectors stopped attending regular meetings with a regional Chemical Industry safety group (a Responsible Care Cell) because the work was not chargeable. This has happily been reversed but the distrust has lived on. There is an urgent need for a simple, transparent charging scheme which does not distort priorities and does not unduly penalise what is a very safe industry.

CONSULTATION DISTANCES

If charging was a political decision, the decisions about how site Consultation Distances should be calculated are much more difficult to disentangle. When asked, the DETR (Department of the Environment, Transport and the Regions: the UK Government department responsible for planning law and the sponsoring department for both HSE and EA) suggested that the decisions were technical and taken by HSE. HSE, on the other hand, suggested that options were offered and DETR chose the one they favoured. There is no doubt about the consequences which have been quite serious in some cases - not for chemical companies (yet) but for the communities and Local Authorities around chemical sites.

The operators of chemical sites have worked with both HSE and EA/SEPA year on year to improve their standards and thereby reduce the risks - to the environment, to safety and to health – on and around their sites. However, seemingly at the stroke of an administrative pen, Local Authorities have found that consultation distances have grown enormously, sometimes by a factor of 6. This means that the area covered can be more than 30 times greater than before and the effect on development in the community around a chemical site can be devastating. As an example, the Local Authority for the Hickson & Welch site has now been advised that it should not allow the rebuilding of the local public library, on its existing site, for its existing purpose.

In some areas, operators are now seen as the "problem" and relationships with the community and Local Authorities have deteriorated. Sites are being pressed to give up their rights to hold chemicals, a move which would, in the longer term, undermine the competitive position of the UK chemical industry. Worst of all, the current position threatens to undermine the whole basis of UK planning controls around Major Hazard sites. In a number of areas, Local Authorities are seeking alternative advice to that given by HSE and are writing planning policies which will allow them to discount HSE planning advice when it suits them. This is an outcome neither the regulators nor the industry can be happy with and it is to be hoped that the current review reportedly being undertaken (mid-summer 2001) will have a positive and constructive outcome.

PROBLEMS WITH SAFETY REPORTS

These problems form the backdrop to the difficulties companies are having writing their COMAH Safety Reports (SRs). Companies' difficulties with SRs cover most of the possible topics in a COMAH report, from the breadth of information to be covered, to the depth of detail required in dealing with specific matters. More disturbingly, exploring these difficulties has displayed a wide divergence between the stated expectations of the UK Competent Authority (CA) and the way companies have interpreted the duties placed upon them to provide information in their SRs.

There is no doubt that the CA has tried to give a lead in understanding (most of) the duties. This is perhaps, not surprising though certainly very welcome. After all the UK legislation was prepared by the regulators and a number of people inside HSE had a major hand in framing the EU directive. The HSE, in particular, has published a very large amount of information and guidance designed to assist operators to write their SRs (ref 1,2). Unfortunately the guidance is not always consistent. Indeed the structure of a safety report suggested in the internal HSE guidance on report assessment (the Safety Report Assessment Manual – SRAM – not published in the conventional sense but available from the HSE internet site: ref 3) differs from that suggested in the HSE "official" guidance (HSG190, "Preparing Safety Reports" ref 2). There is also the feeling that HSE (in particular) published a lot of guidance but then abandoned operators to write safety reports.

In fact, HSE did give further guidance to operators based on the common problems they found in the first SRs submitted, for example by sending a letter to top-tier sites involved in writing SRs (ref 4) and by making presentations to a number of conferences. However, the perception of having been set a complicated test by the CA, being given a tight timetable to write the SR and then being marked on the result – with the CA as judge, jury and executioner – is widespread amongst operators.

THE MEANING OF DEMONSTRATION

From discussions with operators and regulators it is clear that the term demonstration has been viewed as fairly all encompassing, by both the CA and those writing safety reports. It is accepted that the term covers not only technical matters around a particular installation but the whole way a site or company operates. Thus there is no dispute that setting out the company's Safety Management System, and showing that it complies with the principles set out in HSG65 (ref 5) (or an equivalent standard), is an essential part of the demonstration of safe operation. Likewise, procedures for handling emergencies; training for staff at all levels; and methods for assessing and understanding the hazards of the chemicals and processes on site, are all a part of the overall demonstration which are required in the Safety Report.

Accepting that they are part of the demonstration of safe operation certainly does not lessen the problem of writing a SR which adequately deals with these matters. However, the outline of what is required to deal with these subjects is fairly clear. They were dealt with in most recent CIMAH safety reports, for example. Though issues of detail and interpretation (to comply with the requirements of COMAH rather than CIMAH) remain, the basic information and systems should already be firmly in place. For example, for Safety Management Systems the standards are set out in HSG65. HSE inspectors have for several years been discussing with operators of Major Hazard sites how they should comply with those standards. Whilst a company's system may require improvement or writing up in a new way for COMAH, both the underlying structure of the Management System and its basic documentation should have been in place by the time the first COMAH safety reports came to be written. And in general, this will have been achieved by co-operation, cajoling and consent between the regulators and the operator.

DEMONSTRATING THE DETAIL

Whilst many parts of the COMAH report may have been in existence before implementation, HSE (especially) have made it quite clear that COMAH is a major change and they were not looking for a simple re- packaging of existing material in a new way. For the regulators, a COMAH SR was never meant to be a simple revision of a CIMAH SR with a few environmental considerations thrown in.

Perhaps one of the key phrases, used by a number of HSE inspectors, has been "we are looking for demonstration not assertion". Occasionally inspectors would add something along the lines of: "What we mean is, it is no good just giving us a description of your operation and saying you are safe like you did in your CIMAH safety report". This is apparently easy to understand; though when HSE inspectors were challenged to explain it in greater depth they found it more difficult. Usually as the questions became more detailed the answers became more fuzzy and reference was increasingly made to the SRAM (referred to above) or "SRAGs" (installation specific assessment guidance) which either had been or were to be published.

A HYPOTHETICAL PLANT

Consider a fictitious case, say a phosgene generation plant. It is clear that the simple statement: "We operate plant Q to make 300 tonnes of phosgene per annum in accordance with our site procedures and in equipment built to the appropriate standards", is not an exhaustive demonstration of safe operation – even if the statement is absolutely true. But then consider mechanical integrity of the plant (bought in as a proprietary unit from abroad). It will have a reaction vessel which will operate at elevated temperature and pressure. The vessel will have a pressure rating and be subject to the Pressure System Regulations. The site has a safety management system which includes a computer-based planned maintenance system (recently audited by the EA) and has a contract with external assessors to inspect vessels and to give reports. The company has the (satisfactory) reports on the vessel from the assessors, on file, on site.

To most operators, the existence of an auditable system, which complies with the Pressure System regulations and is known to the regulators to be working, would seem to be an adequate demonstration of safety of the pressure vessel (which is one small part of the overall safety of the phosgene plant). The problem is that there are an infinite (or at least large) number of questions that could be asked about this vessel. What was the design standard? How does this compare with the latest British Standard? How do you justify any differences between the two standards? If the vessel was built before the last revision of the British Standard has the vessel been reassessed? How was the re-assessment done? Who did the re-assessment? What were the competencies of the person(s) doing the assessment? What steps did the operator take to satisfy themselves that these were the right competencies and that they were actually held?

Then to consider a different aspect: what is the effect of operation at elevated temperature? Has the vessel been de-rated for this operation? Was a standard used to do this de-rating? Why did the operator use this standard? If a standard was not used what is the justification for the method

used? Who judged that this was an acceptable method? What is the reliability of the temperature control system? Has the vessel been assessed against the maximum possible temperature which could be reached if the temperature control system fails? How is this temperature arrived at? What about a co-incident pressure excursion?

EFFECT ON SAFETY DEPARTMENTS

Clearly, the number of apparently reasonable questions can be made to grow very rapidly. And I should stress that questions very like these have been asked - in writing - by the CA before they would accept operators' safety reports. Each question on its own has obviously seemed reasonable and justifiable to one member of the CA's assessment team. The net effect however is neither reasonable nor justifiable – not reasonable because there must be a point at which safe operation has been demonstrated without every possible question being answered and not justifiable because asking and answering all these questions will not add to the safety of the plant, its operators or the wider community. Indeed the opposite is now widely felt to be true by many operators. So much effort is being put into writing COMAH Safety Reports, that "normal" safety work is not being done. As an example, on the Hickson & Welch site in 2000 about 50% of all the effort of the SHE department went into writing the COMAH safety report. The net benefits do not justify the time spent.

It is worth noting that this problem is not a function of the way an operator has tried to write the demonstration of safety and is not related to the actual safety of the installation being described. The problem clearly exists for any descriptive, non-quantitative method. It also exists for more formal methods of demonstration, such as the "bowtie/lines of defence" methods used by many companies (including H&W). It certainly also exists for quantitative methods of assessment where many questions can be asked about the source, reliability and applicability of the data being used even before questions are asked about the details of the plant being assessed.

ACCEPTABLE RISK

The current HSE view of acceptable levels of risk is set out in "Reducing Risks, Protecting People" (ref 6) where HSE argues that showing that a plant has a particular risk level associated with it (where ever that lies on the conventional ALARP diagram), is not adequate to comply with the ALARP principle for high hazard plants. There is now a need to show what further measures could be/ could have been used to reduce risks still further. Where they are not used the operator will need to show an assessment to "demonstrate" that their rejection is acceptable. This assessment is, in the same way, open to the same type of detailed questioning. Again, the need in COMAH to take "all measures necessary to prevent major accidents" (how can an operator demonstrate that they have assessed "all measures"? in what detail?) shows the extent of the problem which exists for all safety reports, whatever assessment methods are used.

It must be remembered that this is a problem of description, not of safety. The problem is one of writing a demonstration; not of operating a safe plant. Where any part of the CA has had reservations about the safety or operation of a plant they have used their existing powers under Health and Safety or Environmental Protection legislation to bring about improvement. Even when serving Improvement Notices for inadequacies in Safety Reports, the CA have not generally been asking for changes to plant or management systems. The notices have been for changes or additions to the Safety Report, leaving the fundamental safety of the plant unchanged.

OFFER TO CO-OPERATE

The problems outlined above were one of the subjects discussed at the "Implementing Seveso II" conference held in London in November 2000. The conference also had presentations from the regulators and the regulated in other EU member states. These presentations tended to highlight the much more relaxed attitude to the implementation timetable being taken in the other member states. They also tended to show a much more collaborative approach to the production of Safety Reports in other countries, with inspectors working with companies to produce a report acceptable to

everyone. A very notable example of this was Holland where inspectors were members of the project boards in companies producing SRs, guiding companies through the SR writing process. This will ensure that the finished report will be of the form required by the Dutch CA and makes the idea of the Dutch CA rejecting an operator's report nonsensical (though all too familiar in the UK).

The presentation to the conference by one of us (ref 7) focussed on the UK experience and the problems operators were having with the regulations. Other presentations, notably from Colin Pinder of BP (ref 8) and Dave Mercer of Vopak (ref 9), discussed how individual companies had dealt with "demonstration" in their reports and the difficulties they had encountered. All the companies involved, even those who had worked with HSE writing "trial" SRs before the regulations came into force, had great difficulty understanding and complying with the CA's requirements. It was also felt by operators that the CA had adopted a very confrontational approach with a rapid use of Improvement Notices if a company did not produced what the CA considered a satisfactory report at the first attempt. The regulator's view seemed to be that the CA had produced more guidance than ever before, including guidance on the way reports would be assessed, and it was up to companies to provide the CA with what was required. Any failure of understanding or of commission was to be laid at the operator's door and "punished" by serving an Improvement Notice, something reported to the public and noted by many corporate head offices as a serious black mark against a site's SHE performance. Given the non-British ownership of much of the UK Chemical Industry and the fact that SHE performance is used both for deciding the location of future investment and for determining managerial rewards, the service of an Improvement Notice is a serious event in most companies. Not surprisingly, this has given a situation in which operators feel very unhappy about the CA's approach to COMAH and feel that that the problems industry has had in writing safety reports are not being understood or addressed by the CA.

It must be said that this message was understood by the CA at the conference and engendered considerable debate, both on the conference floor and in the breaks between sessions. In discussion, the idea of a workshop to try to answer some of these concerns by developing some model demonstrations was developed.

AIMS AND APPROACH OF THE WORKSHOP

From the outset the workshop was seen as a co-operative venture between the regulators and operators. The principal aim was to develop a number of demonstrations which could be used by both sides – by the operators as models when writing demonstrations for their own processes and by the regulators as a yardstick to judge the adequacy of the demonstration offered in submitted Safety Reports. Provided a common understanding could be reached, both sides felt that some of the heat could be taken out of this part of COMAH report writing – which would be a step to restoring relations to a more normal footing.

Clearly, in any reasonable time the demonstrations could only deal with a small area of a Safety Report – operators spend months writing their reports. There was no intention to deal with areas of the report such as the environment around a site, the safety management system or issues of competency and training. The demonstrations were necessarily limited to the technical matters around particular parts of the installation. To give a reasonable spread, four demonstrations were proposed: a batch reactor; a warehouse and associated storage; bulk liquid storage; and the mechanical integrity of pressurised equipment. These are still very wide areas and so, to enable a focused discussion, a more detailed description of the supposed installation was provided for each case study. There is a danger in this; the more detailed the description the less easily applicable the demonstration to other plants or sites. However without the descriptions little progress could have been made. The descriptions were written by operators with each particular type of plant to ensure reasonable accuracy and coverage of the essential points. They are not reproduced here but are available from the authors on request (and will be available at the conference).

FORM OF THE WORKSHOP

As the workshop was to be a co-operative venture the aim was to have equal numbers of operators and CA members present, 12 from each side. Two days were set aside for the workshop, which was held in Dalton Grange, Huddersfield, courtesy of Syngenta. Following an introduction, the workshop was to split into groups with each group comprising 3 from each side. Each group was intended to discuss one of the demonstrations in detail and then, if time allowed, go on to considering one or more of the other case studies. Finally the groups would come back together and discuss their conclusions ("consensualise" them) and the demonstrations would then be taken away and written up. As an aside, one remark made by a member of the CA team in one of the pre-meetings, is worthy of note. Having seen the timetable he remarked "Yes, but what will they [the groups] do on day two?" To an operator who has struggled firstly to understand demonstration and then has spent some months writing a safety report, this remark points to an apparent serious misunderstanding, in some parts of the CA at least, of the difficulties and the effort required to write a Safety Report.

OUTCOME OF THE DISCUSSIONS

The CA fielded Inspectors from HSE, EA and SEPA, ensuring that all the regulators were represented. The industry representatives likewise covered a good cross section of operators: from dedicated storage sites, to large production facilities and including a range of smaller chemical sites. The CA brought slightly more than their quota of members to the workshop which enabled some (useful) overlap between groups but otherwise the workshop ran to plan, though the timetable proved to be very tight with discussions continuing across all the breaks and over dinner. However, none of the groups was able to fulfil the aim of the workshop in the time available, as none of them was able to write up an agreed demonstration. Neither the tightness of the timetable nor the failure to deliver the demonstrations during the two days, was a surprise to the operators present. Some groups did manage to get closer to the aim of the workshop and produce an outline of a demonstration, though others (notably the batch reactor group) found that there were quite large differences between what the operators felt was reasonable to incorporate in a safety report, and what the representatives of the regulators felt would be required for an acceptable demonstration. The final, plenary session of the workshop allowed the whole group to discuss the outcome of each of the working groups. This session did clearly point up the areas of agreement, which were considerable, as well as highlighting the areas where disagreement remained. Following the workshop, one member of each group undertook write up a summary of the discussions. These have been incorporated into the work described below.

SUBSEQUENT WORK

Following the meeting, HSE, EA and CIA representatives have met to produce a guidance document, based on the workshop's discussions, but also informed by the CA's experience of reading a (rapidly increasing) number of safety reports. The guidance is intended to be published by the CIA and is aimed at helping both those CIA members yet to submit their safety reports and at helping the Competent Authority assessors decide what is a reasonable level of detail to include in a safety report. It should be stressed that the guidance will be about the level of detail that is required to make a demonstration in a safety report. It is not intended to show what is required to control the risks of a major hazard plant adequately. It is expected that inspectors will, in the course of visit over the lifetime of the report, follow up the information given in a demonstration, both to audit the information and to explore the systems described in much greater detail.

At the time of writing the guidance is not (quite) complete but it will consist of a set of general principles to follow when making demonstrations, plus a table showing the details required for demonstrations for a short list of 'top events' associated with each of the four cases. The guidance will be published in the autumn of 2001 and will be available (and described in more detail) at the conference.

1. "A guide to the Control of Major Accident Hazard Regulations 1999", L111, HSE Books, 1999
2. "Preparing Safety Reports: Control of Major Accident Hazard Regulations 1999", HSG190, HSE Books, 1999
3. "COMAH Safety Report Assessment Manual", Available to download from the HSE web site at www.HSE.gov.uk/chid/COMAH2/
4. "Early lessons on COMAH Safety Reports", standard letter sent by the CA to COMAH top tier sites, 2000
5. "Successful health and safety management", HSG65 (revised), HSE Books, 1997
6. "Reducing risks, protecting people", HSE discussion document, 1999, available from the HSE web site at www.HSE.gov.uk/discdocs/closed/dde11.pdf
7. "COMAH – an Industry View", Ken Patterson, Hickson & Welch Ltd, presented at "Implementing SEVESO II Conference", London, 6 – 8 November 2000. Paper and presentation available via the HSE web site at www.HSE.gov.uk/hid/seveso2/main.htm
8. "COMAH – Progress to date: Demonstration and SMS", Colin Pinder, BP Amoco, presented at "Implementing SEVESO II Conference", London, 6 – 8 November 2000. Paper and presentation available via the HSE web site www.HSE.gov.uk/hid/seveso2/main.htm
9. "Seveso I to Seveso II – from Describe to Demonstrate", Dave Mercer, Vopak, presented at "Implementing SEVESO II Conference", London, 6 – 8 November 2000. Paper and presentation available via the HSE web site www.HSE.gov.uk/hid/seveso2/main.htm