

COMAH SAFETY REPORT REGIME – EVALUATING THE IMPACT ON “NEW ENTRANT” ESTABLISHMENTS

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In April 1999 the COMAH¹ regulations superseded the previous onshore major hazard regulations - CIMAH -. Although the CIMAH² regulations included safety report requirements for the high hazard “top tier” (TT) establishments the COMAH regulations introduced a more rigorous regime because of the need to demonstrate that all necessary measures have been taken to control major accident hazard risks. The COMAH regime brought into scope of top tier requirements a significant number of establishments not previously covered by TT requirements. – COMAH TT “new entrant” establishments. Using these “new entrant establishments” as a study group HID is undertaking a project to identify the impact of being under the COMAH safety report regime has on health and safety performance. The first stage of the project (to be completed by January 03) is to obtain views from industry and inspectors along with baseline data on incident performance. This paper presents the methodology used in this first stage of the project and briefly considers future stages of the project.

KEYWORDS: COMAH, impact evaluation

INTRODUCTION

HSE is currently undertaking an impact evaluation programme looking at its key activities to gain an understanding of whether these activities are meeting their objectives and that resources are being used in the most effective way. As part of this impact evaluation programme HSE has identified a need to evaluate safety case type regimes to inform the debate³ on the value of these regimes for regulating high hazard industries. To contribute to this HID is conducting a project to identify the impact that the COMAH safety report regime has on the management of major hazard risks. Although the COMAH regulations are enforced in the UK by the “Joint Competent Authority” (HSE working with EA & SEPA), this study is to investigate the impact of HSE’s activities on the major accident risks to people. This is envisaged to be a long-term project looking at the effect of the regime over the safety report 5-year cycle and beyond. This paper sets out the methodology the first stage of the project is using.

The specific question the project is designed to explore is **“What is the impact of the COMAH Safety report regime on Health and Safety Performance in respect of Major Accident Hazards?”**

BACKGROUND

In April 1999 the COMAH regulations superseded the previous onshore major hazard regulations - CIMAH -. Although CIMAH included safety report requirements for the high

hazard “top tier” (TT) establishments the COMAH regulations introduced a more rigorous regime. COMAH also brought into scope of top tier requirements a significant number (approximately 120) of establishments not previously covered by CIMAH TT requirements. These “COMAH TT new entrant” establishments provide an opportunity to capture data on their performance as they go through the safety report process. This project uses them as a study group and will compare their performance with those establishments that were TT under CIMAH and those that are LT under COMAH.

At the end of 2000, The Health and Safety Executive, in response to the Revitalising Health and Safety initiative and the setting of targets for the Health and Safety Commission for the first time since its inception, commissioned a review of the evidence of the impact of their work⁴. One of the outcomes of the research has been the development by HSE of a more comprehensive evaluation framework. A key part of this has been the development of guidance on impact evaluation methodology for HSE⁵ the project follows this guidance which draws on experience elsewhere in evaluation of government policy.

PROJECT METHODOLOGY

OVERVIEW

The complex nature of COMAH sites along with the full range of Health and Safety duties on establishments means that there is no single performance measure that can be effectively used to indicate the impact of the COMAH safety report regime on an establishment. For example the key objectives of COMAH are to reduce COMAH major accidents and mitigate successfully those that do occur. So we could just measure the numbers of COMAH major accidents that occur, however COMAH Major Accidents are few in number annually and on their own provide a poor measure of performance. Additional information could be gained from looking at the wider picture of reportable incidents (injuries and dangerous occurrence) under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995⁶ (RIDDOR) from these establishments but a significant number of these incidents may have little or no link to performance in respect of Major Accident Hazards. (eg Slips, trips and falls).

Consequently to establish a pragmatic picture of the performance of establishments and the impact the COMAH safety report regime has, a range of data will need to be gathered. This project sets out to obtain both quantitative data i.e. details of accidents, DO's and enforcement action that does have some relationship to major hazards and qualitative data i.e. views of the establishment's operator and HSE inspectors - on the establishment's performance. To this end the methodology is divided into three distinct parts as listed below:

- Survey of establishment operators
- Survey of regulatory inspectors
- Provision of COMAH focussed quantitative data

To account for counterfactual issues (i.e. the performance these “new entrant” establishments would have returned had they not been brought into the COMAH TT

regime) the project will obtain data from the three broad groupings of COMAH establishments listed below:

- TT establishments (excluding new entrant establishments)
- LT establishments
- TT new entrant establishments

The quantitative and qualitative data obtained from these groups will be analysed on a comparative basis to provide information on the relative performance of the groups.

With the new entrant establishments having to submit their safety reports in February 2002 the aim is to capture their views whilst the safety report process is still current in their minds. By reviewing the information gathered the aim is to identify changes in performance of the new entrant establishments during their first years under the COMAH safety report regime.

OPERATOR SURVEY

To provide objectivity and independence from HSE this part of the project has been contracted out to ENTEC UK Ltd. This ensures that:

- Operators feel able to freely express their views (both positive and negative) on the value of the COMAH regime, (data provided to HSE from the survey will ensure anonymity).
- Appropriate expertise and resources are applied to obtain quality data within the timescale of the project.

The aim, objectives and survey method used are set out below.

Aim

To obtain qualitative data, from operators of identified new entrant COMAH establishments and counterfactual establishments, that shows whether changes in management and control of major hazard risks have occurred as a result of being within the COMAH safety report regime.

Objectives

Data to be gathered (from “new entrant” and counterfactual group operators) regarding:

- Views/perceptions of duty holders of the effect of being under the COMAH safety report regime including any negative effects.
- What those in the safety case regime do differently (better or worse) compared with
 - before they were in the regime
 - those not in the regime.
- Specific arrangements (either hardware or systems) in place or being put in place as a result of the COMAH safety report regime and the writing of the safety report.
- Specific key COMAH requirements and their effect. Including views on whether they would have been addressed without COMAH.
- What they learned about how they control their major accident hazards from being under the safety report regime.

Method

Overview of approach

The survey is being conducted in the following stages:

- Stage 1 – define the key issues to be addressed to answer the question “What is the impact of the COMAH Safety report regime on Health and Safety Performance in respect of Major Accident Hazards?” and agree the “qualitative data” to be collected during the survey
- Stage 2 – develop and carryout postal questionnaires for target and counterfactual groups;
- Stage 3 – analyse questionnaire findings and establish objectives for follow-up interviews;
- Stage 4 – conduct face-to-face and telephone interviews at a selection of establishments;
- Stage 5 – analyse, interpret and report the survey findings.

The method is described in detail below.

Stage 1: define key issues to answer and agree qualitative data to be collected

To identify the data to be collected through the survey a workshop with HSE and Entec was held where the question being asked was explored. The range of potential impacts of the COMAH requirements were discussed informed by evidence from HSE inspectors, technical press and Entec. Key issues to deal with and areas for questions were identified.

Issues included:

- Difficulty in collecting statistically significant safety data for major hazards due to the low frequency of events
- Demonstrating that improvements have occurred because of regulations
- The qualitative nature of the data to be collected

The key question areas identified were the identification and measurement of changes (improvements) in:

- Safety management systems
- Procedures or methods of working (including emergency arrangements)
- Changes to hardware, control systems, etc.
- Overall health and safety activity (i.e. What effect has the focus on Major Hazard aspects had on occupational health and safety issues.)
- Resource expenditure on Health and safety issues.

This stage of the project resulted in an improved understanding of the question being asked and the data needed to answer it.

Stage 2: develop and carryout postal questionnaire

Questionnaire design. The postal survey is being carried out using a questionnaire based on the output from stage 1. The questionnaire is designed to maximise the data collected whilst minimising the impact on the organisations being surveyed and achieve the following goals:

- address all of the project objectives, without making the questionnaire too large,
- the sequence and wording of questions be easy to understand and minimise risk of biased responses;

- questions about sensitive issues such as approach to health and safety management, must be asked in a non-controversial and answerable manner
- target and counterfactual groups must be able to answer the questions in a consistent fashion that allows comparison
- questions must identify whether safety performance has changed due to COMAH regulations or other driving factors.

The final structure and content of the questionnaire is designed to:

- elicit the changing nature of safety management and the contribution made to this change by the safety report regime;
- identify differences between the target and counterfactual groups;
- estimate the costs (both direct and indirect) of compliance with HSE regulations, especially the additional costs of becoming a top-tier COMAH site;
- identify measures for long term (linked to the 5 year COMAH safety report cycle) impact evaluation.

With the postal survey involving approximately 300 questionnaires it was important to test the questionnaire at an early stage to ensure it's ease of use and that the questions had the appropriate breadth and depth required to address the issues posed by this project. To this end the questionnaire was piloted at a small number of representative establishments and revised in line with the feedback received.

Sample structure and size. All 120 of the “new entrant” target sites received a questionnaire. Due to the relatively small data set it is essential that as many responses are received as possible. Each target site not replying in an appropriate time will be followed up by telephone. However, a 100% response is highly unlikely and a goal of 60% is thought to be more realistic.

To achieve the project objective of identifying specific changes attributable to the new COMAH regime, it is essential to involve the counterfactual groups to allow the impact of becoming a top-tier site to be assessed. Initially the questionnaire will be sent to approximately the same number of establishments from each counterfactual group, as to the target group. It is recognised, however, that the counterfactual data will not be as useful as that collected from the target establishment and so they will not be followed up with the same rigour. The goal is to achieve a representative sample of counterfactual establishments of similar profile to the target group. The focus will be on sites that are only just below the top-tier cut-off point and those that are just above it as the issues at these establishments will be the most similar to the target sites.

Stage 3: Analyse and interpret questionnaire responses. The purpose of analysis at this stage in the project is to prepare for the follow-up interviews. This includes identifying establishments to be included in the follow-up and the topics for discussion.

Along with a summary of data collected from the postal survey, stage 3 of this project will also result in a pro-forma question sheet to be used during the follow-up interviews. The question will be focussed on areas where it proved difficult to collect data in a postal

survey, and where interesting trends have emerged. The use of a pro-forma will ensure consistency of data collected in the interviews.

Stage 4: Conduct follow-up interviews

Sample structure and size. The purpose of the follow-up interviews (these will be carried out by a combination of face to face and telephone interviews) is to validate and enhance the results from the postal survey. It is not intended to interview every participant. Instead establishments will be selected giving a similar profile, but numbering approximately 15–20% of the original. The structure of the sample will be selected according to the following two factors:

- i) Representation of all sizes of organisation
The individual responses to the postal survey will be from establishments of different sizes. Therefore it is proposed that a selection of small, medium and large sites are selected for the follow-up interviews.
- ii) Representation of all sectors
The selection of establishments for follow up interviews will also strive to ensure a representative sample of all the sector types. It is possible that the distribution of sector types would be related to the size of the establishments.

The focus for follow-up interviews will be on the target establishments. A small number of interviews with counterfactual establishments to act as control will also be conducted.

Stage 5: Reporting

The report from this survey will aim to answer the key question “What is the impact of the COMAH Safety report regime on Health and Safety Performance in respect of Major Accident Hazards?” from the operator’s perspective. In particular the report will:

- Identify the changes in management of major hazard risks that occur as a result of the COMAH safety report regime.
- Identify the effect on wider health and safety issues.
- Make recommendations on longer-term data needs for ongoing evaluation of the safety report regime giving consideration to the 5 year COMAH safety report cycle.

INSPECTOR SURVEY

The level of independence required for the Inspector survey is different from the operator survey. This survey is to be carried out in house by HID’s quasi independent audit and benchmarking team.

Aims

- To obtain qualitative data, from Regulatory Inspectors (RI’s) of identified “new entrant” COMAH establishments and counterfactual establishments, to show the impact on management of major hazard risks as a result of being within the COMAH safety report regime.
- To identify benefits from the safety report process for the regulation of health and safety. Specifically with regard to the efficiency and effectiveness of regulatory interventions at the establishments.

Objectives

To gather data from “new entrant” and counterfactual group RI’s regarding:

- Views/perceptions of RI’s of the effect of being under the COMAH safety report regime including any negative effects. Need to consider
 - Does COMAH SR regime provide extra regulatory leverage for achieving risk reduction – possible comparison here with LT MAPP regime
 - Does the information gained from the SR process lead to better targeted interventions and planning
 - Use of the SR as a reference document for investigation of incidents and complaints.
- What those in the safety report regime do differently (better or worse) compared with
 - before they were in the regime
 - those not in the regime (Comparison here will be between MAPP and SR regime)
- Specific health and safety arrangements (either hardware or systems) in place or being put in place as a result of the COMAH safety report regime and the writing of the safety report.

Method

Overview of approach

The survey is being conducted in the following stages:

Stage 1 – Define the key issues to explore with RI’s

Stage 2 – Develop and carry out e mail questionnaire

Stage 3 – Analyse the findings and identify any data that requires clarification

Stage 4 – Report the findings of the survey

The method is described in more detail below.

Stage 1: Defining the key issues to explore

Based on the in-depth consideration of issues for the operator survey HID considered further the information to be gathered from inspectors to provide their perspective. It was identified that data needed to be compatible with the operator survey to enable a balanced view of the impact of COMAH to be developed. From this two key areas were identified to explore

- Information from RI’s on the changes they had seen at COMAH sites regarding the management and control of major accident hazards. This would provide a set of data to cross reference/validate information gained from the operator survey.
- Views from RI’s on the positive and negative impact of COMAH for the regulation of their sites.

Stage 2: Develop and carry out the questionnaire survey

For the inspector survey a different level of anonymity was required with individual responses being treated as confidential between the audit and benchmarking team and the inspector involved. It was decided that the most efficient to carryout the survey was via email, as this would make for easier tracking of the survey and provide a quick straightforward route to follow

up any issues where clarification of data was required. The questionnaire was designed to achieve similar goals to the operator survey the key ones being:

- address the project objectives, without making the questionnaire too long,
- the questionnaire to be easily understood, minimise risk of biased responses and be consistent with the operator survey;
- elicit the changing nature of safety management and the contribution made to this change by the safety report regime;
- identify differences between the target and counterfactual groups;
- elicit views from RI's on both the positive and negative impact COMAH has had on health and safety and the way interventions with operators are conducted.

To ensure the questionnaire was user friendly, provided the required information and was manageable via the email route the questionnaire was piloted with a small number of RI's covering a range of COMAH establishments. Following the pilot the questionnaire was revised in line with the feedback before being issued for completion.

Sample structure and size. The operator survey targeted approximately 300 establishments, a mixture of top tier, new entrant top tier and lower tier establishment groups. The aim with inspector survey was to cover the same types of establishments but minimise demands on RI's. Because RI's regulate a large number of establishments it was possible to keep the target population to approximately 45 RI's (all safety report assessment managers) that were identified as having involvement with several establishments across the three groups. This target group was designed to give coverage of establishments similar in number, make up and geographic location to the operator survey.

Stage 3: Analyse the questionnaire findings and identify data requiring clarification

The responses will be analysed to identify differences and similarities between the three groups with particular reference to the new entrant group. The outcome for COMAH sites regarding the management and control of major accident hazards will be compared/validated against the findings from the operator survey. With regard to the impact on how RI's carryout interventions at site the analysis will look for both consistent and conflicting views from RI's with a view to identifying any common themes or concerns.

If required RI's will be contacted to provide clarification on their responses.

Stage 4 Report the findings of the survey

The report from this survey will aim to answer the key question "What is the impact of the COMAH Safety report regime on Health and Safety Performance in respect of Major Accident Hazards?" from the RI's perspective. In particular the report will:

- Identify the changes in management of major hazard risks that occur as a result of the COMAH safety report regime.
- Identify the positive and negative impact COMAH has on the way RI's interventions with operators are conducted.

QUANTITATIVE DATA

Quantitative data overview

The overall objective of COMAH is to reduce COMAH major accidents and mitigate successfully those that do occur. So as a start point in looking at quantitative data the numbers of COMAH major accidents can be measured and tracked over time.

Fortunately COMAH Major Accidents are few in number annually but consequently provide a poor outcome measure. Also as new entrants to COMAH the key target group of this project will have no Major Accident history. For these two reasons other quantitative data measures have been identified to provide data for this evaluation. The quantitative data types that provide useful measures are reported incidents (COMAH Major accidents, accidents & DO's) and enforcement data (notices and prosecutions). Enforcement data when considered with intervention activity will give some indication of the level of compliance at groups of establishments.

Data Sources

HID information systems will provide quantitative data on an ongoing basis and back to 1996 on the following:

- Accidents
- Dangerous Occurrences
- Notices issued
- Prosecutions taken

Target groups

To obtain comparative data from which trends/differences between new entrant establishments and control/counterfactual groups can be identified data from the following groups will be obtained.

- All TT establishments
- All LT establishments
- TT new entrant establishments

Data requirements

To obtain information on both overall performance and COMAH related performance the following data will be obtained for the above target groups:

- COMAH Major accidents reported to Europe
- Total reported accidents broken down by type (fatal, major, over 3 day)
- Total reported dangerous occurrences
- COMAH related reported accidents (See below)
- COMAH related reported dangerous occurrences (See below)
- Total enforcement notices
- Total prosecutions
- COMAH related notices (See below)
- COMAH related prosecutions. (See below)

COMAH related data

Incident data

Although COMAH major accidents are uncommon there are incidents that occur at establishments, which if they hadn't been controlled could have carried on to become a major accident. An analysis of the RIDDOR reporting requirements identifies types of Dangerous Occurrences and Accidents that could be considered as potential major accident precursors. Listed below is the common agreed set of DOs & accidents that HID uses to monitor major accident precursors.

Dangerous occurrence/accident	RIDDOR category
Dangerous occurrence	Pressure systems
Dangerous occurrence	Electrical short circuit
Dangerous occurrence	Explosives
Dangerous occurrence	Explosion or fire
Dangerous occurrence	Escape of flammable substances
Dangerous occurrence	Escape of substances
Accident	Loss of consciousness by asphyxia or exposure to harmful substance
Accident	Chemical or hot metal burn to the eye.

Enforcement data

Some legal provisions have strong links with Major Accident issues when considered in the context of COMAH establishments. Those provisions listed below (when used at COMAH establishments) are considered to provide an indication of formal enforcement used to correct deficiencies linked to the control of major accident hazards. This can be tentatively used to give an indication of major accident compliance levels at COMAH establishments when considered against intervention activity at the establishment.

- The Management of Health and Safety at Work Regulations 1992/1999
- The Control of Industrial Major Accident Hazards Regulations (CIMAH) 1984
- The Control of Major Accident Hazards Regulations (COMAH) 1999.
- The Pressure Systems Safety Regulations 2000
- The Pressure Systems and Transportable Gas Containers Regulations 1989
- The Fire Certificate (Special Premises) Regulations 1976
- The Highly Flammable Liquids and Liquefied Petroleum Gases Regulations 1972
- The Explosives Act 1875/1923
- The Control of Explosives Regulations 1991

Time periods for data collection

Data will be obtained for 12 month periods based on HID work planning years (i.e. 1st April to 31st March) from 1st April 1996 to 31st March 2002.

Normalising the data

To take account of variations in

- i. numbers of establishments subject to COMAH
- ii. inspection activity at establishments (re enforcement data).

The aim is to try and normalise the data obtained in some way, possibly as set out below.

For incident data

By number of incidents per 100 establishments

For enforcement data

By time spent by inspectors on COMAH work at establishments.

Data regarding the time spent on COMAH work by inspectors will come from COMAH charging records. This data is only been available from 1999. Prior to this obtaining comparable data may not be possible but options are being explored.

Data analysis

The incident and enforcement data obtained for the identified target COMAH groups will be analysed on a yearly basis looking for trends over years and significant differences between establishment groups.

RESULTS

The operator and inspector surveys are planned to return findings by October 2002, at this point quantitative data for years up to April 2002 will have been obtained. The data from these three parts of the project will then be brought together reviewed and analysed to identify what information they provide regarding the impact the COMAH safety report regime has had on the Health and Safety Performance, in respect of Major Accident Hazards, of the COMAH “new entrant” establishments. It is planned that the use of the three parts of the project will enable triangulation of the data providing an element of assurance to the project findings.

Note – As an HSE research project the findings of the Operator Survey will be made available in an HSE Contract Research Report. The dissemination arrangements for the findings of the complete project have yet to be agreed.

USE OF THE PROJECT FINDINGS

HID’s aim from the project is to learn from both the positive and negative findings of the project and use them to inform:

- i. HID policy on the COMAH safety report regime and in particular the five-year update process.
- ii. HSE’s overall policy on permissioning regimes.
- iii. HSE’s thinking on regulating high hazard industries.

FUTURE STAGES OF THE PROJECT

As set out in the introduction to this paper this project is the first stage of a much longer plan to evaluate the impact of the COMAH safety report regime. It is envisaged that the process will cover at least the five-year period of the COMAH safety report cycle and probably beyond. It is hoped that the findings and experience gained from this project will provide a strong steer to the key long-term measures that should be used to provide data on the impact of the COMAH safety report regime.

The measures currently being considered for long-term use are:

- Annual analysis of the quantitative data as set out in this paper
- Further questionnaire surveys of operators, inspectors and other stakeholders at key stages in the COMAH cycle, specifically at the 5 year update and at the midpoint during inspection informed by the results of SR assessment.
- Monitoring of other new entrant groups as they come within scope of COMAH, for example as a result of CHIP 3 or amendments to Seveso II

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