ABB discuss the importance of and approach towards generating a “Representative Set of Major Accident Hazards” as part of COMAH Report development.

Blog with Sarah Bickerstaffe

As uncertainty looms large, safety should, as always, be at the forefront of our minds.

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The year 2020 has been an eyeopener for us both personally and professionally. It has taught us to innovate amid a global pandemic and to run our daily business virtually while successfully overcoming challenges associated with lockdown restrictions that have in ABB’s case prevented face-to-face client interaction and site visits. Amid ongoing uncertainties, the focus on process safety has remained paramount throughout the pandemic and ABB continues to support our customers through remote completion of key deliverables.

Throughout the pandemic, we at ABB have worked with clients running Upper Tier COMAH (Control of Major Accident Hazards) sites in the UK to generate the Representative Set of Major Accident Hazards (MAH) for their COMAH Safety Reports. This Representative Set referred to as a “Rep Set” is a list of hazardous events that have the potential to cause harm and provides the foundation from which an Upper Tier COMAH Safety report is constructed. The Rep Set should be a representative summary of the entire
site and therefore include a variety of MAHs which reflect “what could go wrong” for all sorts of processes and equipment across the site.

The Rep Set is a crucial component of the COMAH report but identifying a consistent and focused Rep Set of Major Accident Hazards is often the misunderstood part of the Report. Let us delve deeper into how and what scenarios are selected as a part of the list.

**Producing a “Representative Set” of MAH’s**

The selection process must demonstrate a consistent approach to MAH identification and should reference a site’s Hazard Identification data (for instance, HAZID, PHA or HAZOP records), and ideally be grouped into a “top down” approach of similar hazards. This data should ideally identify, and risk rank all possible loss of containment scenarios relating to the site which can then be systematically reviewed to produce a Rep Set of MAH Scenarios which is traceable to site records and can be justified to the Competent Authority (CA).

The MAHs, selected as part of the Rep Set must be representative. For large sites this may involve:

- Sorting or grouping “MAH Scenarios” together based on their ultimate consequences or equipment similarities to avoid repetition.

- Analysing the risk ranking in the Hazard Identification to select a MAH which is adequately representative of it’s designated “group” of similar MAHs.

- Analysis of the risk ranking also helps with the identification of “Sensitivity Cases” which are extensions of the main MAH Scenario. These can be identified in the initial selection process based on various criteria such as increased frequency, but lower severity compared to the selected main MAH in the Rep Set.

At ABB we have developed a well-established systematic process of generating a Rep Set based on working with clients to analyse, sort and rank data from Hazard Identification studies to produce a traceable and justified list of scenarios linked to both Hazard identification studies and equipment present on site. (see Figure 1)
Figure 1: Producing a Representative Set of MAH Scenarios from historical site hazard identification data

I have experienced working with many clients, all with different perceptions of the COMAH site’s required level of involvement in generating the Rep Set. However, I can’t emphasise enough how important it is that the external Consultant does not generate the list in isolation, as this underpins the development and structure of the COMAH Safety report. Good, consistent “Representative Set Selection” relies upon the support and invaluable knowledge of the personnel ensuring the safe operation of a COMAH site as part of their roles, especially those who are involved in Hazard Studies (HAZID, PHA or HAZOP). These studies become the key contributors to the list as their output is used to build the Rep Set. The link between Hazard Study and Rep Set is fundamental.

Why is this important?

It is essential that the Representative Set and importantly the process used to develop it meet the major requirements associated with COMAH Safety Reports outlined by the Competent Authority (CA) such as Criterion 10.1 (Reg 8(b) Sched 3 Para 5(a)) and Criterion 10.1.2 (Schedule 3 Paras 5(a)(i),(ii),(iii)). These state that the safety report should identify and describe all potential major accident scenarios, and should demonstrate the implementation of a systematic process to identify events and event combinations that helps in understanding major accident hazards. Issues with “Representative Set Selection” resulting in failure to demonstrate that these criterion are sufficiently met can be a major obstacle that COMAH Establishments struggle with, costing time and money until the necessary standards are achieved.

As we embark on a new year, safety should, as always, be at the forefront of our minds. It is worth remembering that a COMAH report is a live document that should be kept up to date in line with any changes to plant and processes.

Look out for the next in the series of COMAH blogs where we discuss scenario development and consequence, likelihood and risk.
ABB’s Process Safety team provides expert process and functional safety knowledge and thought leadership to the process industries. The team offer bespoke, pragmatic solutions based on operational experience, best practice and regulatory feedback to ensure safe, smart and sustainable operations.

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For further information see ABB COMAH support