

HAZOP: getting started from scratch

6 Engineering are safety engineering consultants for the major hazard industries and we have recently facilitated some hazard and operability studies (HAZOPs) for a client in the chemicals industry. Their site is quite mature and unfortunately, they didn't have HAZOP studies for most of it, so they asked us for help. Normally, HAZOP studies are undertaken during the design process and should be regularly refreshed (e.g. every 5 years). However, this isn't always the case and we thought we would offer some guidance for those who may need to get started from scratch.

First of all, it's worthwhile discussing what a HAZOP is. A hazard and operability study is looking for hazards which might arise from operating a process. A HAZOP is a formal, facilitated, multi-discipline, guideword-led study. Most importantly though, it is a team effort. It follows a set methodology, although there are variations on the theme. It examines the process in detail and tests out various parameters to see if a hazard or an operability issue (which tend to lead to hazards in the long term) could arise. It is set out in a tabular format.

For example:

To be able to get this far, however, requires some preparation; examples can usually be found online. Here are some hints and tips of what you will need:

1. P&IDs: for whatever process you want to examine, you will need piping & instrumentation diagrams. They need to be up to date, so take the time to walk the lines, mark up any changes and update them.
2. Operating procedures: these will help to determine the process description and therefore the HAZOP team when completing the study.
3. Supporting documentation: it is really useful to have documentation such as material safety datasheets, hazardous area classification, and other such documentation available at the HAZOP. If it isn't available, then the team may not be able to answer fundamental questions and can lead to needing to assume the plant is operating in a hazardous condition.
4. Control and instrumentation: it's handy to produce a cause and effects matrix which describes how it functions. For example, temperature transmitter TT-1234 closes valve XZ-1234 on high-high alarm at 80C. If this information isn't available, expect an action to go find it out.

5. HAZOP procedure: although your HAZOP facilitator (or chairperson) will be able to guide you through the process, it's helpful to have your own corporate HAZOP procedure. This will spell out who is responsible for what and how it will be done.
6. Terms of reference: the ToR is used to collate the information that the study will use, as well as conveying details such as when, where and who. The ToR should be issued well enough in advance of the study for the HAZOP team to be able to read it and familiarise themselves.
7. Training: at the start of every HAZOP, we ask whether there is anyone attending that has never attended a HAZOP before. If there is, we summarise the HAZOP process for them. Although the methodology is quite simple, a brief course for the attendees in advance of the study is particularly useful.
8. Software: there are various software packages about which are very powerful. However, they come at a price. We recommend sticking to basics and using Word or Excel; at least for the first few studies.
9. Reporting: a formal HAZOP report is needed, with a document number. Ask the facilitator to provide this.
10. Actions are raised where the HAZOP Team considers they are required because either insufficient information is available, or there is insufficient protection against hazards. Remember that risk reductions contained in actions aren't in place until they're completed. Actions should be formally closed out and supporting evidence provided.

If you need support, then 6 Engineering are here to help you wherever you are. Please feel free to call us on 01925 357677 or visit the website www.6engineering.co.uk

