History does not have to repeat itself: Incident databases as a "collective memory"

What would happen if the electricity supply would be interrupted throughout your whole plant for just 250 milliseconds? Would you like to find out?

It is argued that experience is the best way to learn. Yet, industry obviously can't afford to "stage" incidents for the purpose of learning – there is way too much at stake financially, environmentally and in terms of dangers to human health. Thus, as much as possible needs to be learned from accidents that could not be avoided or – even better – from risky situations that have been resolved without major damage. "Near misses" occur with much greater frequency and may thus reveal more possible paths to a potential major accident. And in the interest of companies, but also of society, it is desirable that companies learn not only from their own experience, but also from the "collective memory" of the industry as a whole.

This collective memory is available in the shape of incident databases. A number of them exists today in Europe, partly as the outcome of publically funded research projects, partly on a commercial basis, partly as non-profit databases that are maintained by official or private institutions.

An incident database, depending on how it is structured, managed and used, can be a reference point of collective memory and specific knowledge for an almost unlimited range of safety specific questions and issues. It may act as an important source of information for risk assessment tools, it provides a link to reality and raises the awareness of employees and management, it can serve for training purposes and can contribute to the improvement of safety management systems.

To achieve maximum benefit, a database should meet a couple of criteria: It should be open access so that anybody can access all information without charges or other restrictions. To facilitate access, the interface should be intuitive and user-friendly. The reports should be specific, complete and comprehensive, and fact-based rather than open for interpretations. Data quality should be consistent both in terms of level of detail throughout the database and in terms of the quality of the sources. The higher the number of single cases covered in the database the higher is the value for users. At the same time, the cases have to be comparable in terms of industry concerned (e.g. the chemical industry) and sectors (e.g. occupational versus process safety). A further categorization within the database according to type of incident (e.g. explosion) and subcategories (e.g. ignition source) and a standardized data structure make the database workable. They should be supported by a comprehensive search system. Industry involvement is highly recommendable as it increases both the number of submissions and the acceptance within the industry. Another important factor for acceptance is a transparent workflow, giving users the chance to assess the expected quality of the data.

Some examples for public access databases are the EU database eMARS that covers major industrial accidents, the German databases ZEMA (for major accidents) and KAS-AS-ER (for near misses, focusing on national legislatory requirements) and the French ARIA database that goes beyond process safety, including also transport of dangerous goods, safety of pipelines and storage facilities and is available in both English and French.

Another example for a non-governmental project is DECHEMA's online Database for Incidents in the chemical industries that started in 1996. One characteristic of this database is its minimalistic approach: Incident reports are listed only if they are unique, i.e. they are not duplicating observations described in other reports in the database.

Also the incident reports are reduced to a minimum text, but adequate to support the reader to understand and use the lessons learnt.

This project has being actively supported from the very beginning by VCI (the German association of chemical industries). All these years the VCI company members have been voluntarily providing information on their process safety incidents as well as near-misses to enrich the content of the database. It is, however, not restricted to VCI members – any chemical company worldwide can submit reports on process safety incidents or near misses. A working party with the name "Lessons from Process Safety Incidents" is responsible for the data quality control as well as for further guiding the development of the database. The working party consists of nominated representatives from industry, authorities, research and education as well as the Chairman of the Committee for Incident Evaluation (AS-ER) of the Commission on Process Safety (KAS). The representation of KAS within the working party is an active link to the German lawmaker. The work in the working party is voluntarily for its members, the meetings are not open to the public and the minutes are confidential.

Submitted reports are anonymized, erasing the person who submitted, the year and the location or company where the incident took place. The information about the source is kept confidentially only for discussions with the submitting person to finalize the report; once the report is published, this information is permanently erased.

The preparation of the final version of an incident report for the database takes place in three phases: First the incident is reconstructed and discussed in order to understand beyond any reasonable doubt what happened and why. Then all information not absolutely necessary for the understanding of the report is eliminated, Finally, the report is abstracted as much as possible.

The database is publicly available and currently provides more than 140 short, focused, and easy to understand incident analyses in English and German. After an online registration, automatically notifications are generated for every new incident added to the database. Access, research and the notification are free.
http://processnet.org/en/incident_db.html

Do you want to know more? Contact

Dr.- Ing. Konstantinos Mitropetros
DECHEMA e.V.
Tel.: ++49 – (0) 69 7564 127
e-mail: mitropetros@dechema.de