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Summary
of the final report for the project

Introduction of an information network about state of the art safety engineering according to the Major Accidents Ordinance

by

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1 Task

Compliance with state of the art safety engineering is one of the basic operator obligations laid down in the German Major Accidents Ordinance. In many cases the determination which measures in detail fulfil the unspecified legal term state of the art safety engineering can be based on Technical Regulations or regulations of the institutions for statutory accident insurance and prevention. However, for small and medium-sized enterprises it is difficult to keep track of the great number of reference sources. A flexible database focussed on plant design is able to give support by outlining relevant Technical Regulations, other reference sources and expert knowledge as well.

The further development of Technical Regulations and state of the art safety engineering has always been a response to conclusions from accidents or even major accidents in terms of the Major Accidents Ordinance. Therefore databases such as the ZEMA Database with reliable information present an important reference source for the assessment of a plant design and thus an aid for the determination of state of the art safety engineering.

A challenge for all information systems and the database DoSiS and the ZEMA-database as well, is to provide users with information as simply and quickly as possible. In view of the information age for this project an active information management was set up and realized by a news-letter system.

The aim of this research project is the introduction of an information network about state of the art safety engineering according to the Major Accidents Ordinance. Reliable information with regard to safety relevant plant design and the evaluation of major accidents in Germany are to be presented to a user group as great as possible. Access is possible by the public entrance of the Internet portal and an active information management.

2 The Internet Portal InfoSiS

2.1 System Content Management

The Internet portal InfoSiS consists of three components

- DoSiS: Documentation system of state of the art safety engineering.
- ZEMA: Database of the Central Reporting and Evaluation Office for Hazardous Incidents and Incidents in Process Engineering Facilities.
- ·AIM: Interactive information management.

The basis of the Internet portal InfoSiS with the three mentioned components is the Content Management System (CMS) exozet.cms R4 Framework the technology of which is based on open sources. This CMS provides all functions necessary for administration and presentation of interactive contents. In this internal section the organization and maintenance of the Internet portal is carried out by employees of BAM and UBA.

With the user administration integrated into the CMS, users who want to enter plant designs into the database are registered and assigned to user groups. The different user groups have different rights for the modification of the database contents.

The elements used in DoSiS: Plants, Plant Elements, Technical Regulations and so forth are ordered in a very flexible tree structure. Modifications of the content, release of new plant designs and other organizational tasks are also carried out very effectively by aids of the CMS.

In addition to pictures and documents the administrators (BAM, UBA) can also assign information on major accidents and incidents in process plants taken from the ZEMA database to specific plants.

Text of the web pages can be changed directly in the CMS thus enabling updating without any programming effort in future. Data import from the ZEMA database, dispatch of the newsletter, administration of users and processing of e-mails is realized by an editor which is also part of the CMS. An online help for all menu items with essential information for handling the system is available as well.

2.2 Documentation system of state of the art safety engineering according to the Major Accidents Ordinance DoSiS

In order to offer the database DoSiS to interested users before implementing the Internet portal a single PC-version of the database was developed and published in June 2002. However, the crucial point of introducing an information network about state of the art safety engineering was the Internet accessibility of the database.

The development of the database structure and the user interface was achieved by close cooperation of UBA and BAM. The result is a very good presentation of the complex interrelations and the great amount of information. The functional scope of the database was adapted to the new possibilities of the CMS during the development phase and is clearly wider as in the PC-version.

In order to fulfil the ordinance on the creation of barrier-free information technology, a separate barrier-free Internet entry was developed because the complex user interface of DoSiS cannot be transferred appropriately without functional restrictions.

After a test phase of several months and the installation of the barrier-free Internet entry the Internet portal went online on 18.02.2004. The Internet portal can be reached under www.infosis.bam.de.

For the description of a plant design a great number of possibilities are allowed for in DoSiS. This complexity might be a problem for new users who want to publish their own concepts. Therefore an assistant for the input of plant designs was developed. This assistant reflects and supports the systematic procedure to publish a plant design developed in the course of the research project.

For the presentation of a safety concept in DoSiS the plant is divided into several elements to which then the safety requirements are assigned in form of Technical Regulations and so on. First of all the plant is divided into groups (e.g. storage tank, pump station) and then other groups or elements (e.g. process control equipment) are assigned to these groups. The plant design is reflected by this “modular system”. In a second step Technical Regulations and safety notes are assigned to the plant, groups and elements. The assignment is done under the aspect that the danger and the respective necessary safety measure relate to the corresponding element.

The new conception of data organization in DoSiS results in a large degree of flexibility. Restrictions in the possibilities for presentation of new plant designs were not found. Furthermore the possibility to comment assignments represents an essential development of the conception of DoSiS. These comments provide further information on the reasons for specific assignments for the user.

All information about the plant design including pictures, related Technical Regulations and safety notes can be saved as a pdf-file. For those plant designs entered in the meantime into DoSiS these files are summarised in the annex .

For the extension of the database safety concepts for further plants in the field of cold storage of gases, plants with dust/air mixtures and for the distribution of hydrogen were compiled by experts according to § 29a BImSchG.

2.3 ZEMA Online

A great number of interested users can be reached by the Internet-presentation of the ZEMA- database of the Central Reporting and Evaluation Office for Hazardous Incidents and Incidents in Process Engineering Facilities. Search functions now allow an easy identification of specific incidents which then may be stored in a file. Out of this consideration the ZEMA-database was integrated into the Internet portal InfoSiS

Using different search filters the user may select accidents or incidents he is interested in. Search results are indicated with a brief description and the date and may be marked for output as a pdf-file. Preparation of a pdf-file containing all events found by the search is also possible. The layout of the pdf-file for an event corresponds to that of the familiar ZEMA data sheets.

2.4 AIM

In order to reach a user group as great as possible and to provide users with information about major accidents or new safety relevant plant designs as quickly as possible, an active information management is necessary and was realized by the Newsletter-System AIM.

The enrolled user can limit the information sent by Newsletter by specifying types of substances and plants. He then receives the following information by e-mail:

- a short information about new Hazardous incidents and incidents in Process engineering Facilities the information on which is not yet finalized,
- a communication about Hazardous incidents and Incidents in Process engineering Facilities having completed data records and
- a short information in case a new plant design has been incorporated into DoSiS.

2.5 Future development of InfoSiS

Since February 2004 InfoSiS is publicly accessible. The access rate has increased continuously and reached its highest level to date of more than 2000 hits per month in September 2004 following the presentation of the Internet portal in the journal “Technische Überwachung”. The concept and possible applications of InfoSiS were explained in various lectures and discussions in particular with authorities in the field of the Major Accidents Ordinance.

The possibility of a systematic research for majorHazardous incidents and Incidents in Process engineering and the active information management were considered as very helpful in all discussions. The use of DoSiS as support for the assessment of plant designs was basically appreciated, whereas the possibility of incorporating new plants was noted with some reservation due to a lack of time.

This publication of well proven and tested concepts for safety relevant questions may cause a unification of safety requirements in Germany. It also may result in a further development of state of the art safety engineering by identifying different operating methods and the expected expert discussions about the presented designs. Integration of this development into a committee of the future commission for plant safety would be very helpful and present a quality assurance measure.

Also in future the incorporation of new plant designs into the database DoSiS and their evaluation will mainly be carried out by BAM – as a contribution to ensuring and further developing public-technical safety. However, the majority of required safety concepts has to be provided by operators, experts or authorities.

The Federal Environmental Agency will continue to attend to the ZEMA-database. An expansion of the database to also collect data on major accidents within Europe would be very useful as there is currently no direct access to

these data. These data could be maintained directly via Internet by an extension of the user surface with a protected entrance.

3 Summary

With the presented research project an information network about state of the art safety engineering according to the Major Accidents Ordinance was published. Reliable information with regard to safety relevant plant design (Database DoSiS) and the evaluation of major accidents in Germany (ZEMA-database) can be retrieved for free. Access is possible by the public entrance of the Internet portal InfoSiS (http://www.infosis.bam.de/) and an active information management (AIM).

The modular concept of the documentation system DoSiS provides a basis for the evaluation of specific plant designs for authorities, operators and experts. In addition the input of plant designs is possible for enrolled users by Internet. After examination this information is incorporated into the documentation system and thus documents the development of state of the art safety engineering.

A great number of interested users are reached by the Internet-presentation of the ZEMA-database. Search functions allow for easy identification of specific incidents. In order to reach a user group as great as possible and to provide users with information about major accidents or new safety relevant plant designs as quickly as possible, an active information management is required and was realized by the Newsletter-System AIM

Also in future incorporation and evaluation of new plant designs and updating of laws, regulations and technical rules in the database DoSiS will mainly be carried out by BAM. The Federal Environmental Agency will continue to attend to the ZEMA-database.