SFK

MAJOR HAZARD COMMISSION

under the
Federal Minister for the Environment,
Nature Conservation and Nuclear Safety (BMU)

Guideline

Aid for integration of a safety management system pursuant to Annex III of the Hazardous Incident Ordinance 2000 within existing management systems

prepared by the Working Group on
Management Systems

SFK-GS-31

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adopted at the 37th Meeting of the
Hazardous Incident Commission (SFK) on 30 May 2001

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The Hazardous Incident Commission (Störfall-Kommission - SFK) is a commission formed pursuant to Art. 51a Federal Immission Control Act (Bundes-Immissionsschutzgesetz) under the Federal Minister for the Environment, Nature Conservation and Nuclear Safety (BMU).
Its offices are housed within the firm of GFA-Infrastruktur und Umweltschutz GmbH.

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1 Introduction

1.1 The Hazardous Incident Ordinance of April 2000

On 2 May 2000, the 12th Ordinance on Execution of the Federal Immission Control Act (Hazardous Incident Ordinance 2000 – 12. BImSchV) was promulgated in the Federal Law Gazette (Part I P. 603 ff.). This ordinance transposes Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances (Seveso II Directive – Official Journal of the EU No. L 10 P. 13 ff.). The new version of the ordinance introduces a number of new obligations for operators and authorities, including the operator's obligations to present a concept for preventing hazardous incidents (Art. 8), to present relevant documentation, within the framework of the safety report, regarding implementation of the concept for preventing hazardous incidents and to provide proof that a safety management system for application of the concept pursuant to the principles of Annex 3 of the ordinance is in place (Art. 9 (1) No.1).

The occasion for studying management systems as ways of improving plant safety was the insight that over 90 % of all major accidents in recent years were due to organisational and management problems and that such problems could be reduced in future through introduction and application of suitable management systems. The European Seveso II Directive states in this context: (Council Directive 96/82/EC) (15) " ... analysis of the major accidents reported in the Community indicates that the majority of them are results of managerial and/or organizational shortcomings; ... It is therefore necessary to lay down at Community level basic principles for management systems ...".

Implementation of this finding, in Annex III of the German Hazardous Incident Ordinance, led to the preparation of the present guidance document.

1.2 Previous aids, provided by the Hazardous Incident Commission, that were taken into account

In advance of transposition of the European Directive into German law, the Hazardous Incident Commission prepared two guidelines:

- Guideline for presentation of a concept for prevention of hazardous incidents pursuant to Article 7 in conjunction with Annex III of the European Directive - SFK GS 23 - and

- Guideline for presentation of a concept for prevention of hazardous incidents and for a safety management system pursuant to Article 9 (1a) in conjunction with Annex III of the European Directive - SFK GS 24.

These guidelines are based on a publication of the European Commission entitled "Guidelines on a Major Accident Prevention Policy and Safety Management System, as required by Council Directive 96/82/EC (Seveso II)". The guidelines differentiate in keeping with Article 7 and Article 9 of the Seveso II Directive and provide specific assistance for users. They are divided in accordance with Annex III of the Seveso II Directive.

Both guidelines provide information on implementation of the legal requirements from the Seveso II Directive regarding the concept for prevention of hazardous incidents and for establishment of a safety management system. This information consists primarily of explanations and specifications regarding the concept's contents and extent and regarding the presentation of the safety management system within the safety report.

One important statement made in these guidelines is that the safety management system pursuant to the Seveso II Directive should be integrated within existing management systems. The guidelines provide no information as to how such integration, including the interfaces to other management systems, could be carried out.

At the suggestion of the Hazardous Incident Commission, and on the instruction of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), a supplementary collection of material on the topic of safety management systems was prepared. This collection (see SFK-GS-25) presents the various materials that were used to prepare the above guidelines. It also summarises the contents of these materials and, in some cases, assesses the materials with regard to their importance.

2 The purposes of this guideline

The purposes of the present guideline are, in supplementation of the guidelines mentioned in the introduction, to provide information about the organisation and structure of a safety management system that, in terms of content, fulfils the requirements of Annex III and the requirements of the amended Hazardous Incident Ordinance 2000 and that takes account of relevant companies' structures and procedures. The latter of these aims means that a safety management system pursuant to Annex III of the Hazardous Incident Ordinance 2000 can be adapted to, or integrated within, other management systems such as those for quality assurance, environmental protection or occupational safety.

- The present guideline should highlight the fact that the establishment and introduction of safety management systems within the meaning of the Hazardous Incident Ordinance may be based on a broad range of existing management systems and concepts. The present guideline's tabular comparisons of management requirements under the Hazardous Incident Ordinance 2000 and elements of existing, well-known management concepts facilitate cross-checking of the necessary measures.

- Operators who wish to establish a new management system will find that the guideline provides an overview of the various different possibilities for fulfilling applicable legal, normative or other requirements.

- The guideline should also give operators information as to how the safety management system can be integrated within existing management systems and how existing systems can be integrated within a safety management system.

Use of the present guideline will provide a framework for implementation of requirements of Hazardous Incident Ordinance Annex III, "Safety management system", and for integration of additional external and internal requirements within company management systems. On the other hand, use of the present guideline cannot, by itself, guarantee that a company complies with all legal framework provisions to which it may be subject. The company must take account of such provisions(as part of the management system) in its documents that specifically describe its relevant internal provisions and processes.

Remark:

Companies will normally find it most effective to operate only one management system within the company. By concentrating in this way , companies avoid conflicts of purpose and interface problems and achieve greater process efficiency within the management system.

In keeping with this recommendation, the last column of the tabular comparison presents short descriptions of important sample modules and processes of an integrated management system. Since integrated management systems must always be designed in a company-specific way, relevant operators must adapt this column, in Tables 1 through 3, in keeping with their individual needs.

Another purpose of this guideline is to support experts and authorities in differentiating review-relevant elements of a safety management system from other elements of an integrated management system.

3 Short description of the management systems covered by the guideline

3.1 Introduction

Since the early 1990s, attempts have been made to develop systematic methods of organisation and management and to standardise such methods internationally. Overall, an issue-oriented approach has been used, beginning with development of quality management standards that would provide, internationally, the same conditions everywhere for quality assurance of products. In ISO *9000 ff.* [1], an instrument was created for documenting and reviewing quality assurance methods and procedures.

After quality the subject of the standardisation of an environmental management system came into focus and ISO 14000 ff. [2] norm was created, where the continuous improvement process was of main concern. Again documentation of processes and organisational structures was an important element. Repeated verification by external certification bodies were designed to assure of the validity of the environmental management system. With the international ISO 14000 ff. standard and the European EMAS regulation [3] now two formalised management systems exist, which may enable enterprises and other organisations to ensure the compliance with European and national regulatory and mandatory requirements. Comparing ISO 14000 ff. with EMAS II shows, that EMAS II requires the fulfilment of additional elements.

In the area of occupational safety and plant safety, there are national standards and guidelines such as the British Standard BS 8800 "Occupational Health and Safety Management System" and the guidelines of LASI (Länderausschuss für Arbeitsschutz und Sicherheitstechnik – Länder Committee on Occupational Safety and Safety Systems) as well as international- guidelines by the International Labour Organisation (ILO).

[1] (DIN EN ISO 9001 [Quality management systems, model for quality assurance / quality-management documentation in design, development, production, assembly and maintenance] (ISO 9001; 1994), Berlin, 1994
[2] DIN EN ISO 14001 [Environmental management systems, specification with instructions for application] (ISO 14001: 1996), Berlin, 1996
[3] EMAS II: environmental management and audit scheme, Council Regulation 761/2001/EEC of 19 March 2001 on voluntary participation of commercial enterprises in a Community scheme of eco-management and eco-audits (OJ EC No. L 114 of 24 April 2001. p. 1 ff)

All of these management systems can be used as the basis of a safety management system or a safety management system can be integrated within these various systems.

3.2 Quality management systems (QMS) pursuant to DIN EN ISO 9001

The Deutsche Industrie Norm (DIN) EN ISO 9001:1994 has been in place since 1994. This standard establishes requirements pertaining to company organisation; their primary purpose is to achieve customer satisfaction through "good company processes" and through avoidance of errors. It calls for description of a company's quality management in terms of 20 quality elements that are closely related to production/provision of a product or service.

With proper application of the ISO 9000 series, quality is defined and viewed as the result of quality-oriented processes within the company. This new, process-oriented approach requires companies to take due account of and consider all of their quality-relevant processes. In addition, it makes all employees – not just that part of the workforce assigned specifically to quality assurance or final checking – "responsible for quality". In other words, it makes quality an "integral" part of a company's entrepreneurial activities.

This global, comprehensive way of viewing a company and its processes is of fundamental importance with regard to practical implementation of management systems. This is because this approach makes it possible to involve, and motivate, employees on all hierarchical levels with the company's success in the areas of environmental protection, safety and occupational safety / health protection and quality.

DIN EN ISO 9001:1994, "Modell zur Qualitätssicherung / QM-Darlegung in Design, Entwicklung, Produktion, Montage und Wartung" (Model for quality assurance / quality management description in design, development, production, assembly and maintenance"), was developed as a tool that suppliers can use to build their customers' confidence in their (the suppliers') quality capabilities. It mandates confidence-building measures such as presenting a quality management system to a customer or to an official assessing agency.

The manner in which a company implements such elements entrepreneurially depends on the company's aims, products, technologies, size and workforce size.

DIN EN ISO 9001:1994 has undergone further development, and now two different versions are available to companies. The main difference between the two is that the new version, the standard DIN EN ISO 9001:2000, is even more strongly oriented to processes and procedures than the older version.
In establishing quality management systems, some companies have used the old version and some have used the new version; both systems will therefore continue to coexist for some time. Consequently, the tabular overview (Table 1) presents both options, especially in the interest of assisting small and medium-sized companies in remaining within their chosen systems.

3.3 Environmental protection management systems pursuant to DIN EN ISO 14001

The ISO 14000 standards series, which has world-wide validity, was developed by the International Organization for Standardization (ISO) as a means of supporting companies in establishing and expanding in-company environmental protection management systems. The requirements for such management systems are specified in ISO 14001. DIN EN ISO 14001:1996, "Umweltmanagementsysteme – Spezifikation mit Anleitung zur Anwendung" ("Environmental management systems – specification and guideline for use"), has had Deutsche Industrie Norm status since October 1996.

The overall aim of DIN EN ISO 14001:1996 is to promote environmental protection and avoidance of environmental pollution/stresses, in harmony with socio-economic requirements. It requires companies to establish environmental policies and concrete environmental aims and to orient their relevant processes (the relevant processes must be identified and considered) to such policies and aims.

The standard also requires each company to project its goals (and targets) on to all relevant processes (on all hierarchical levels!), in order to make the goals "integral components" of the company. This requirement brings up practical challenges: the company and its employees must apply the company's own environmental protection requirements – in conformance with all applicable laws – as well as the environmental protection requirements of its customers, to each specific process.

The structure of an environmental management system pursuant to DIN EN ISO 14001 is thus oriented to process sequences. Under this system, continual improvement becomes a part of each process. The standard defines five processes that make up an environmental management system.

These processes shall enable organisations to introduce a management system and procedures in order to establish environmental policies and goals. The processes shall also ensure and verify that the according targets are met and shall demonstrate this to the interested public. Certification of the management system shall also be possible. A ISO 14000 ff. certification can be a part of the EMAS validation, which has additional requirements. Thus duplication of efforts can be avoided. The following discussion of environmental management systems is focussed on ISO 14000 ff., because the elements of the management systems of ISO 14000 ff. meet the requirements of EMAS II.

While the structure of an environmental management system pursuant to DIN EN ISO 14001 differs extensively from the functional, element-oriented structure defined by DIN EN ISO 9001: 1994, the two standards' systems have many common features. As a result, an existing management system pursuant to the DIN EN ISO 9000 series can serve as a basis for an environmental management system. Tables 1 and 2 in Chapter 5 of the present guideline, show this in their comparison of requirements for management systems.

The ISO 14001 standard mandates a risk-oriented approach in establishment and application of an environmental management system. The relevant steps are described in detail in the supplementary standard 14004 "Umweltmanagementsysteme: Allgemeiner Leitfaden über Grundsätze, Systeme und Hilfsinstrumente" ("Environmental management systems: general guideline to principles, systems and aids"). The procedure described by this standard provides a useful way of orienting a company's management activities to the company's specific relevant environmental impacts, thereby ensuring efficient, effective use of resources.

The methods described by ISO 14004 are generally applicable. For example, they are detailed in standard BSI 8800 with regard to requirements for a work-safety management system. The introduction to DIN EN ISO 14001 explicitly notes that the standard does not have the purpose of erecting non-tariff-compliant trade barriers or of tightening legal obligations.

3.4 Occupational health and safety management systems

Unlike quality and environmental management systems, occupational health and safety management systems have not been standardised at the international level. Although the International Organization for Standardization (ISO) considered this question, in 1996 and 2000, the national standards organisations did not generate enough support for the idea of preparing a relevant standards series (Germany was among those that rejected such international standardisation). The reasons why such support was lacking included certification issues, the tradition that the social partners (employees' and employers' organisations) should be involved in work-safety matters and extensive existing work-safety regulations, which tend to have a strong national basis.

As a result of a lack of international standards, various country-specific and industry-specific standards have been developed. These standards have been issued in different ways, as standards, guidelines or recommendations, and have been disseminated through various different channels. The present guideline refers to three important standards:

- The **British standard BS 8800**, which was one of the first standards to be published and which has attained significance even outside the UK.
- **LASI Specification LV 21**, a standard upon which the German Länder have agreed.
- The **ILO Guidelines**, adopted in April 2001, comprise an internationally agreed recommendation on work-safety management systems; they thus provide a framework for national application.

In addition to these three standards, **OHSAS 18001** has become increasingly important. In contrast to what is often assumed, this is not a British standard; it is a paper that was prepared by a number of representatives of interest groups (mostly certification organisations) and that was published as a report by the British BSI standards organisation, which itself carries out certification. Because the de facto aim of this standard is certification of occupational health and safety management systems, the standard conflicts with the common German standpoint on management in occupational health and safety.

This fact, and the lack of participation of important affected groups, especially the social partners and the public sector, are the main reasons why this standard is not considered in the present guideline.

3.4.1 The British "Occupational Health and Safety Management System" standard, BS 8800

BS 8800:1996[4)] is a guideline standard. It was written by Technical Committee HS/1 of the British Standards Institution , under the direction of the Health and Safety Environment Sector Board. The standard was published with the approval of the Standards Board and has been in force in the UK since May 1996. It may be applied by any organisation; its aim is to improve occupational health and safety performance. It does not mandate certification.

The standard itself describes two approaches, which do not significantly differ, to the establishment of a occupational health and safety management system. The first is based on the British HSE guideline (Successful Health and Safety Management HS(G)65). The second is based on the structure of ISO 14001 in the area of environmental management systems. It offers special advantages to organisations that wish to orient their occupational safety management systems to environmental management systems pursuant to ISO.

The standard also contains 6 annexes. These provide detailed assistance, with practical examples, regarding application of various procedures (risk assessment, auditing, etc.), and application and implementation of the overall approach in question.

The purpose of BS 8800 is to serve as a guideline that organisations can use in setting up occupational health and safety management systems for effective implementation of defined strategies and aims in the area of occupational safety. The guideline is also intended as a guideline for integration of occupational health and safety management within overall management systems.

[4] Ritter A, Langhoff T, Arbeitsschutzmanagementsysteme - Vergleich ausgewählter Standards Schriftenreihe der Bundesanstalt für Arbeitsschutz und Arbeitsmedizin Fb 792, 1998

3.4.2 Specification, of the Länder Committee on Occupational Health and Safety and Safety Systems (LASI), on occupational health and safety management systems

Within the context of numerous relevant activities and ongoing work in Germany on the topic of occupational health and safety management systems, LASI prepared a specification for such systems and published it in April 2000. LASI is a body made up of German Länder ministries with responsibility for occupational health and safety. The LASI specification thus represents a consensus position of the German Länder on occupational health and safety management systems.

The specification describes the minimum requirements that apply, from the perspective of the German Länder, to introduction, implementation and further development of occupational health and safety management systems. It is based primarily on the Bavarian OHRIS concept and on Hessen's ASCA concept. It also takes account of the requirements set forth in the "Key points of the Federal Ministry of Labour and Social Affairs, the supreme occupational health and safety authorities of the Länder, the institutions responsible for accident insurance schemes and the social partners, regarding development and assessment of concepts for occupational health and safety management systems". The aim is to integrate safety, health protection and ergonomic, healthy workplace design, at the earliest possible phase, within operational structures and processes, and to improve these factors continually.

The specification includes the customary elements of management systems, but its primary orientation is to safety and health protection. In the framework of occupational health and safety, it places particular emphasis on fulfilment of obligations under public law, on assessment and minimisation of hazards, on regulations pertaining to operational disruptions and emergencies, and on training. Separate sections are devoted to medical precautions for the workplace and to health protection. The system is audited by means of internal system and compliance audits.

3.4.3 ILO guidelines on occupational health and safety management systems

In April 2001, an international group of experts completed deliberations for the ILO guidelines and approved them. The purpose of these guidelines is to provide an internationally coordinated framework for occupational health and safety management systems.

In keeping with the ILO's internal structures and procedures, consultations took place on a tripartite basis, i.e. governments, employees and employers are all equally represented, with equal status, in the experts' group. This approach is in harmony with the usual participation arrangements in occupational safety consultations.

In Germany, the ILO guidelines were discussed at the draft stage with all interested groups, in the framework of an advisory group within the Federal Ministry of Labour and Social Affairs, and met with basic approval. Since the final deliberations did not lead to any substantial structural changes, and since important German proposals for changes have been taken into account, it may be assumed that the interested groups in Germany will all support the ILO guidelines.

The guidelines are aimed primarily at the ILO member states, i.e. their governments. They call on the governments to create national frameworks (including national framework documents) for occupational health and safety management systems, using the guidelines as a basis. This national-level approach provides sufficient latitude for adaptations to regional circumstances. Nonetheless, the guidelines do provide a framework within which national specifications are expected to remain.

In addition, the ILO concept calls for creation of specific occupational health and safety management system concepts for certain types of organisations, especially concepts that permit practically oriented implementation in small and medium-sized enterprises (SME).

Such concepts make it possible to apply the extensive requirements for occupational health and safety management systems to specific frameworks – for example, those of companies with certain common characteristics, such as size, sector or types of risks.

The requirements for occupational health and safety management systems comprise standard elements of management systems, specified for occupational safety, and are basically oriented to the PDCA cycle (**P**lan, **D**o, **C**heck, **A**ct). Special attention is given to employee participation and to the special needs of small and medium-sized companies.

Companies can apply the ILO guidelines directly. Nonetheless, the guidelines' basic concept calls for governments involved to prepare national documents that provide practically oriented support for introduction and operation of occupational health and safety management systems.

3.5 Integrated management systems

A system's function and effectiveness depends decisively on the way in which its various components, elements, processes etc. are integrated and interact. To integrate a system, a company must define its organisational structure and procedures in a clear, company-specific way. Organisational specifications must define all of the relationships within the system and all interfaces to external systems.

In searching for solutions for individual systems that interact with other systems, companies must pay close attention to solutions' integrability, in order to reach overall solutions that are free of interface problems. This requirement can be met via a process-oriented approach.

3.5.1 Core elements of an integrated management system

In spite of the differences between the various accepted models, analysis of different management systems has revealed common features. Often systems differentiate between three different types of core processes:

- Operational processes
- Support or infrastructure processes
- Management processes

Operational processes are company-specific processes or procedures through which products are produced or services are provided. Normally, they represent a company's specific know-how and core competencies and therefore are company-specific in nature.

The documentation for a management system (such as a management handbook) usually pays close attention to such processes and describes them in detail. Each company will be familiar with them and will have relevant instructions for procedures, operations and/or specific tasks. On the other hand, the way in which the work processes are systematically analysed often leaves considerable room for improvement.

In an integrated management system, the various procedures in operational processes must be reviewed to determine whether the company is familiar with all relevant aspects of environmental protection, plant safety and occupational health and safety and quality and is taking all of these aspects into account. In addition, the company must determine whether there are any new or pressing risks with respect to environmental and safety laws. Since legal aspects have grown in significance in Germany (for example, Germany currently has over 8,000 environmentally oriented laws, ordinances and other legal regulations), assessment of all company operations in the light of environmental laws may be necessary.

Support or infrastructure processes are the processes that make value-addition and management processes possible. They play an indispensable role in the smooth functioning of other company processes.

In its structure and procedures, a company defines itself internally and externally and identifies each employee's place within the company. The company assigns rights and obligations to each employee and defines operational processes in a manner that permits the company's goals to be reached. Suitable communication and documentation, both internal and external, is used to ensure that each of the company's employees is aware of his or her rights and obligations and knows what contribution he or she makes to the company's success. In a related effort, it is ensured that employees have all the materials and information at hand that they need to carry out their work. Needless to say, such information includes the documentation of the management system.

To succeed in competition and achieve its aims, a company must have informed, trained employees. A company informs and trains its employees so that they can assess the consequences and impact of their activities – in both professional and private contexts. As a result, training must be considered a central element in any company's personnel management.

Management processes play an essential role in a functioning management system. These processes define the company's management strategies and resources. They provide the basis for effective, efficient management, and they define management obligations and commitment within the framework of the management system.

Management processes

- monitor compliance with the management system.
- detect the causes of errors and prevent errors in future.
- identify potential risks and prevent potential errors.
- determine the status of the management system, co-ordinate its further development in future and support relevant decisions.

In this context, company policy plays a special role in a management system. Company policy gives all company employees a vision of the company's aims and targets, as well as a standard for their own personal actions within the company.

For certification purposes, correlation matrices can be used to transfer the above-described model to other standards systems. For experts conducting reviews, such matrices facilitate the process of becoming acquainted with a company's individually tailored management system.

3.5.2 Implementation of an integrated management system: an example

An example for implementation of the management system described above, within the framework of a handbook structure, could be as follows:

1. Description of the company and its policy

2. Management processes

    - Company principles and goals
    - Organisation and communication
    - Management system description
    - Continual improvement
      corrective measures, audits and review
    - . . .

3. Support processes

    - Documentation
    - Training and instruction
    - Environmental impact
    - Precautionary measures
    - Health precautions
    - Management of outside companies
    - . . .

4. Operational processes

    o Production
        - Legal requirements for procedures and products
        - Production planning and procedures
        - Quality and product release
        - ...
    o Product handling, storage and transport
    o Maintenance
    o . . .

Finally, we again explicitly want to note that in the framework of the present guideline, any description of an integrated management system – and especially the sample handbook outline – must be seen as only one of many different possibilities for implementing such a company management system. Companies will find that they can implement other solutions that permit better adaptation to specific company circumstances – and they must do so, if they are to achieve the most efficient and successful management systems for their own purpose.

4 Structure and content of the tables for comparing the requirements for management systems

Tables are used (see Tables 1 through 4) to compare the requirements for safety management systems pursuant to Annex III Hazardous Incident Ordinance 2000 with those for other management system standards.

The structure of these tables is described below.

4.1 Tables 1 through 3

In each case, column 1 contains the requirements from Annex III nos. 1, 2 and 3a through 3g of the Hazardous Incident Ordinance. Column 2 correlates the content of requirements of Annex III with those requirements of the individual paragraphs of the Hazardous Incident Ordinance that specify the relevant aims, requirements, necessary organisational and technical measures and that could influence the design and implementation of a company's safety management system. A safety management system must support fulfilment of the requirements of the Hazardous Incident Ordinance. Columns 1 and 2 are thus identical in all tables.

The right columns of Tables 1 through 3 are also identical. These columns list examples of some (not all!) possible processes, of a complete-coverage, integrated management system, that are relevant to implementation of a safety management system and to fulfilment of the requirements of Annex III of the Hazardous Incident Ordinance. In implementation of the Hazardous Incident Ordinance within the framework of existing systems, this column can be replaced by a company-specific management system or by the elements or processes of such a system.

In **Table 1**, the requirements of quality management system standards are correlated with requirements for a safety management system pursuant to Annex III of the Hazardous Incident Ordinance 2000. Column 3 of Table 1 shows correlation with elements of DIN EN ISO 9001:1994. Column 4 of Table 1 presents a possible correlation of processes of DIN EN ISO 9001:2000.

DIN EN ISO 9001:2000 is included in the comparison of requirements for a safety management system pursuant to Annex III Hazardous Incident Ordinance with those for other management system standards because the process-oriented approach of ISO 9001: 2000 provides the necessary flexibility for establishment of a company-specific management system that is oriented exclusively to a company's own procedures. In keeping with DIN EN ISO 9001 – 2000, a process is understood as a "system of activities that convert input into results, with the help of resources".

In **Table 2**, Column 3, the requirements for an environmental protection management system pursuant to DIN EN ISO 14001 are correlated with the requirements for a safety management system pursuant to Annex III of the Hazardous Incident Ordinance 2000. Column 4 is empty.

In **Table 3**, the requirements of occupational health and safety management system standards are correlated with the requirements for a safety management system pursuant to Annex III Hazardous Incident Ordinance 2000. The following standards are included:

- ILO-Guidelines on OSH-MS (Column 3)
- LASI Specification LV 21 (Column 4)
- British Standard 8800 (Column 5).

The presentations in Tables 1 through 3 make it possible to adapt or integrate a safety management system pursuant to Annex III of the Hazardous Incident Ordinance 2000 to/within a company's functional or process-oriented management system, or integrated management system, where such a system conforms to the above-mentioned standards and regulations.

4.2 Table 4

Table 4 shows correlation of requirements for a safety management system pursuant to Annex III of the Hazardous Incident Ordinance 2000 with processes and elements of a safety management system pursuant to UBA (Federal Environmental Agency) Research Report 10409422 (Column 3). Columns 1 and 2 are identical with those of Tables 1 through 3.

5 Table section

5.1.1 Table 1: Safety management system pursuant to Hazardous Incident Ordinance, and quality management system DIN EN ISO 9001:1994 (DIN EN ISO 9001:2000)

5.1.2 Table 2: Safety management system pursuant to Hazardous Incident Ordinance, and environmental protection management system DIN EN ISO 14001:1996

5.1.3 Table 3: Safety management system pursuant to Hazardous Incident Ordinance, and occupational health and safety management system standards

5.1.4 Table 4: Safety management system pursuant to Hazardous Incident Ordinance, and safety management system pursuant to UBA Research Report 10409422

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
1. Mayor accident prevention concept – Overall aims – General principles of actions with respect to the control of major-accident hazards • Written form	Art. 3 General obligations of the operator Art. 4 Requirements for the prevention of major accidents Art. 5 Requirements intended to limit the effects of major accidents Art. 6 Additional requirements Art. 7 Notification Art. 8 Major accident prevention policy, concept for prevention of major accidents, taking into account the principles of Annex III	4.1.1 Quality policy 4.1.2 Organization 4.2 Quality system 4.14 Corrective and preventive action	4.1 General requirements 5.1 Management commitment 5.3 Quality policy 5.4.1 Quality objectives 5.4.2 Quality management system planning 5.5.1 Responsibility and authority 8.5.2 Corrective action 8.5.3 Preventive action	**Company policy, principles, aims**
2. Safety management system (SMS); general requirements	Art. 9 (1) No. 1 Implementation of the major accident prevention concept and application of an SMS in accordance with the principles set out in Annex III	4.2 Quality system	4.1 General requirements 4.2 Documentation requirements	**Management system General description**

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3a Organisation and personnel • Roles and responsibilities		4.1.2 Organization	5.5.1 Responsibility and authority	**BASIC ORGANISATION** • Normal organisation • Legally mandated organisation • Emergency organisation • Crisis organisation (Provide resources, guideline delegation, etc.)
	Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities	4.1.2.3 Management representative	5.5.1 Responsibility and authority 5.5.2 Management representative	
	Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority)			**COMMUNICATION** • Internal • External
	Art. 12 (1) No. 2: Assign a person or staff unit to be responsible for limiting the impacts of major accidents	4.1.2.3 Management representative	5.5.1 Responsibility and authority 5.5.2 Management representative	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
• Training requirements	Art. 6 (1) No. 4: Training of personnel in proper operational and safety instructions	4.18 Training	6.2.1 General relating to human resources 6.2.2 Competence, awareness and training	**TRAINING** • Identify training needs/requirements • Plan training • Carry out training • Assess training success
	Art. 10 (3) Instruction of personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident	4.18 Training	6.2.2 Competence, awareness and training	
• Involvement of employees	Art. 10 (3) Before drawing up the internal alarm and emergency plans the operator shall inform the employees of the establishment about the proposed content and hear their views		5.5.3 Internal communication 6.2.2 Competence, awareness and training	
• Involvement of subcontractors	Art. 6 (1) No. 4: Prevention of incorrect behaviour - in cases when outside personnel is in the establishment - by means of suitable operational and safety instructions	*(4.3 Contract review)* 4.6 Purchasing	7.4 Purchasing	**PURCHASING** • Prepare requirements for ordering process • Obtain and review offers • Select suppliers (assess suppliers) • Order • Receive and check product/service • Handover to orderer for acceptance/checking

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
	Art. 10 (3): Instruction in rules for behaviour during major accidents, for cases when outside personnel is in the establishment		6.2.2 Competence, awareness and training	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3b Identification and evaluation of major accident hazards • Adoption and implementation of procedures for systematically identifying mayor accident hazards arising from normal and abnormal operation • Assessment of probability and severity of mayor accident hazards	Art. 3 (2): Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4): Nature and operation of the installations in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equipping the establishment with adequate warning, alarm and safety equipment	4.9 Process control 4.9 b) "Suitable working environment" 4.9 e) "Approval of processes" 4.20 Statistical techniques	8.1 General relating to measurement, analysis and improvement 8.4 Analysis of data 8.2.3 Monitoring and measurement of processes 6.3 Infrastructure	**MARKET RESEARCH** **DEVELOPMENT** **NEW CONSTRUCTION** **PRODUCTION** • (Legal) framework • Planning • Production • Disruptions of production • Storage and transport **MAINTENANCE** **DECOMMISSIONING** **PRODUCT HANDLING** • **STORAGE** • **TRANSPORT** • **SALES** • **MONITORING**

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
	Art. 4 No. 3: Equipping the installations of the establishment with reliable measuring and control or regulating devices		6.3 Infrastructure	
	Art. 4 No. 4: Protection of safety-relevant parts of the establishment from interference by unauthorised persons			
	Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take technical and organisational safety precautions		6.3 Infrastructure	
	Art. 8 (1) Concept for prevention of major-accidents			
	Art. 9 Safety report pursuant to Annex II No. IV			
	Art. 10 Alarm and emergency plans pursuant to Annex IV Nos. 3 and 4 • Internal alarm and emergency plans • Provide information for external alarm and emergency plans			

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3c Operational control • Procedures and instructions for safe operation • Maintenance • Temporary shutdowns	Art. 3 (4): Nature and operation in keeping with the state of the art of safety technology Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment Art. 6 (1) No. 2: Execution of maintenance and repair work in accordance with the state of technology		7.1 Planning of product realization 7.3 Design and Development 7.5.1 Control of production and service provision 5.7.2 Validation of processes for production and service provision 7.5.3 Identification and traceability 7.5.5 Preservation of product 7.6 Control of monitoring and measuring devices 8.1 General relating to measurement, analysis and improvement 8.2.3 Monitoring and measurement of processes 8.2.4 Monitoring and measurement of product	**PRODUCTION** • (Legal) framework • Planning • Production • Disruptions of production • Storage and transport **MAINTENANCE**

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
			8.3 Control of nonconforming product	
	Art. 6 (1) No. 4 Prevention of incorrect behaviour by means of suitable operational and safety instructions Art. 6 (2) Compiling of stocking-lists	4.5 Document and data control 4.11 Control of inspection, measuring and test equipment 4.16 Control of quality records 4.18 Training	4.2.3 Control of documents 4.2.4 Control of records 6.2.2 Competence, awareness and training 6.3 Infrastructure	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3d Safe management of change • Procedures for planning modifications • Design of new installations or processes	Art. 3 (2) Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4) Nature and operation of the installations in the establishment in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equip the establishment with adequate warning, alarm and safety equipment Art. 4 No. 3: Equipping the establishment with reliable measuring and control or regulating devices Art. 4 No. 4: Protection of the safety relevant parts of the establishment from interference by unauthorised persons Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take the necessary technical and organisational safety precautions	4.4 Design control 4.9 Process control 4.9 d) "Monitoring and control of suitable process parameters and product characteristics" 4.9 e) "Approval of processes" 4.11 Control of inspection, measuring and test equipment 4.12 Inspection and test status 4.11 Control of inspection, measuring and test equipment 4.12 Inspection and test status	7.3 Design and development 7.5.1 Control of production and service provision 8.2.3 Monitoring and measurement of processes 6.3 Infrastructur 7.6 Control of monitoring and measuring devices	**MARKET RESEARCH** **DEVELOPMENT** **NEW CONSTRUCTION** **MAINTENANCE** **PRODUCT HANDLING** • **STORAGE** • **TRANSPORT** • **SALES** • **MONITORING**

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
	Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment	4.11 Control of inspection, measuring and test equipment 4.12 Inspection and test status	8.2.3 Monitoring and measurement of processes	
	Art. 8 (3) Update concept for prevention of major accidents	4.5 Document and data control 4.16 Control of quality records	4.2.3 Control of documents 4.2.4 Control of records	
	Art. 9 (5) Update safety report	4.5 Document and data control 4.16 Control of quality records	4.2.3 Control of documents 4.2.4 Control of records	
	Art. 10 (4) Update internal alarm and emergency plans	4.5 Document and data control 4.16 Control of quality records	4.2.3 Control of documents 4.2.4. Control of records	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3e Planning for emergencies • Identification of foreseeable emergencies	Art. 3 (3) Precautions, in order to keep the effects of major accidents as small as possible Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities Art. 6 (2): Keep available stocking-lists for hazard prevention Art. 8 Concept for prevention of major accidents, Risk analysis and safety measures taken Art. 9 Safety report pursuant to Annex II No. V	4.2.3 Quality planning 4.2.3 a) "Preparation of quality plans" 4.2.3 b) "Identification and acquisition of control/guidance measures"	5.4.2 Quality management system planning 5.5.1 Responsibility and authority 5.5.2 Management representative 8.4 Analysis of data 4.2.4 Control of records 4.1 General requirements relating to the QMS 4.2 Document requirements 5.4.2 Quality management system planning 5.6 Management review	**EMERGENCY MANAGEMENT** **CRISIS MANAGEMENT**

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
• Preparation, testing and review of emergency plans	Art. 10 (1) No. 1: Drawing up internal alarm and emergency plans Art. 10 (1) No. 2: Supply to the competent authorities the information necessary for drawing up external alarm and emergency plans Art. 10 (3) Regularly instruct personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident and hear their views Art. 11 (1) Inform persons who could be affected by a major accident originating in the respective establishment about safety measures and requisite behaviour in the event of a major accident Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority)	4.18 Training	5.4.2 Quality management system planning 4.2.3 Control of documents 6.2.2 Competence, awareness and training 5.5.3 Internal communication 6.2.2 Competence, awareness and training 5.5.3 Internal communication	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3f Monitoring the performance of the SMS • Ongoing assessment of compliance with the objectives • Corrective actions in case of non-compliance • Reporting major accidents or near misses (failure of protective measures) including investigation and follow-up		4.13 Control of nonconforming product 4.14 Corrective and preventive action 4.16 Control of quality records 4.17 Internal quality audits	5.6 Management review 5.5.3 Internal communication 4.2.4 Control of records 8.2.2 Internal audit 8.3 Control of nonconforming product 8.5.2 Corrective action 8.5.3 Preventive action	**CONTINUING IMPROVEMENT PROCESS**
	Art. 9 (5) Review safety report and update if necessary Art. 10 (4) Review and update the internal alarm and emergency plans Art. 11 (2) Review information on safety measures and update if necessary	4. 16 Control of quality records	4.2.4 Control of records	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
3g Systematic audit and review • Assessment of the effectiveness and suitability of the mayor-accident prevention policy and the effectiveness and suitability of the SMS • Updating of the SMS • Documentation provided by the senior management of the establishment		4.1.3 Management review 4.17 Internal quality audits	5.6 Management review 4.2.3 Control of documents 4.2.4 Control of records 8.2.2 Internal audit	(like 3f)
	Art. 8 (3) Update the concept for prevention of major accidents	4.5 Document and data control 4.16 Control of quality records	4.2.3 Control of documents	
	Art. 9 (5) Update the safety report	4.5 Document and data control 4.16 Control of quality records	4.2.4 Control of records	
	Art. 6 (1) No. 4: Proof that personnel has been trained in operational and safety instructions	4.18 Training	4.2.4 Control of records	
	Art. 10 (3) Proof that personnel has been instructed in rules for their behaviour contained in the internal alarm and emergency plans for a major accident	4.18 Training	4.2.4 Control of records	

Table 1: Safety management system pursuant to the Hazardous Incident Ordinance (StörfallV), and quality management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with QMS DIN EN ISO 9001:1994	Correlation with QMS DIN EN ISO 9001:2000	Possible company processes
	Art. 12 (2) No. 2: Documentation on the execution of monitoring and regular maintenance of the installations Art. 12 (2) No. 4: Documentation on the execution of the functional testing of the warning, alarm and safety systems Art. 12 (2) No. 3: Documentation on the execution of the safety relevant maintenance and repair work	4. 16 Control of quality records	4.2.4 Control of records	

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
1. Mayor accident prevention concept – Overall aims – General principles of actions with respect to the control of major-accident hazards • Written form	Art. 3 General obligations of the operator Art. 4 Requirements for the prevention of major accidents Art. 5 Requirements intended to limit the effects of major accidents Art. 6 Additional requirements Art. 7 Notification Art. 8 Major accident prevention policy, concept for prevention of major-accidents, taking into account the principles of Annex III	4.2 Environmental policy 4.3.1 Environmental aspects 4.3.2 Legal and other requirements 4.3.3 Objectives and targets 4.3.4 Environmental management programme(s) 4.4.1 Structure and responsibility		**Company policy, principles, aims**
2. Safety management system (SMS); general requirements	Art. 9 (1) No. 1 Implementation of the major accident prevention concept and application of an SMS in accordance with the principles set out in Annex III	4.1 General requirements relating to EMS 4.4.1 a) "Establishment, implementation and maintenance of the management system" 4.4.4 Environmental management system documentation		**Management system General description**

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3a Organisation and personnel • Roles and responsibilities	Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority) Art. 12 (1) No. 2: Assign a person or staff unit to be responsible for limiting the impacts of major accidents	4.4.1 Structure and responsibility 4.4.3 b) Communication with interested, external parties		**BASIC ORGANISATION** • Normal organisation • Legally mandated organisation • Emergency organisation • Crisis organisation (Provide resources, guideline delegation, etc.) **COMMUNICATION** • Internal • External

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
• Training requirements	Art. 6 (1) No. 4: Training of personnel in proper operational and safety instructions	4.4.2 Training, awareness and competence 4.4.2 b) "Environmental impacts of their activities" 4.4.2 d) "Consequences of departure from specified operating procedures"		**TRAINING** • Identify training needs/requirements • Plan training • Carry out training • Assess training success
	Art. 10 (3) Instruction of personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident	4.4.2 Training, awareness and competence 4.4.3 a) ''Internal communication''		
• Involvement of employees	Art. 10 (3) Before drawing up the internal alarm and emergency plans the operator shall inform the employees of the establishment about the proposed content and hear their views	4.4.2 Training, awareness and competence 4.4.3 a) ''Internal communication''		

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
• Involvement of subcontractors	Art. 6 (1) No. 4: Prevention of incorrect behaviour - in cases when outside personnel is in the establishment - by means of suitable operational and safety instructions Art. 10 (3): Instruction in rules for behaviour during major accidents, for cases when outside personnel is in the establishment	4.4.6 Operational control		**PURCHASING** • Prepare requirements for ordering process • Obtain and review offers • Select suppliers (assess suppliers) • Order • Receive and check product/service • Handover to orderer for acceptance/checking

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3b Identification and evaluation of major accident hazards • Adoption and implementation of procedures for systematically identifying mayor accident hazards arising from normal and abnormal operation • Assessment of probability and severity of mayor accident hazards	Art. 3 (2): Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4): Nature and operation of the installations in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equipping the establishment with adequate warning, alarm and safety equipment Art. 4 No. 3: Equipping the installations of the establishment with reliable measuring and control or regulating devices Art. 4 No. 4: Protection of safety-relevant parts of the establishment from interference by unauthorised persons Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take technical and organisational safety precautions	4.3.1 Environmental aspects 4.3.2 Legal and other requirements 4.4.6 Operational control 4.4.7 Emergency preparedness and response		**MARKET RESEARCH** **DEVELOPMENT** **NEW CONSTRUCTION** **PRODUCTION** • (Legal) framework • Planning • Production • Disruptions of production • Storage and transport **MAINTENANCE** **DECOMMISSIONING** **PRODUCT HANDLING** • **STORAGE** • **TRANSPORT** • **SALES** • **MONITORING**

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
	Art. 8 (1) Concept for prevention of major accidents Art. 9 Safety report pursuant to Annex II No. IV Art. 10 Alarm and emergency plans pursuant to Annex IV Nos. 3 and 4 • Internal alarm and emergency plans • Provide information for external alarm and emergency plans	4.4.6 Operational control 4.4.5 Document control 4.4.7 Emergency preparedness and response		

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3c Operational control • Procedures and instructions for safe operation • Maintenance • Temporary shutdowns	Art. 3 (4): Nature and operation in keeping with the state of the art of safety technology Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment Art. 6 (1) No. 2: Execution of maintenance and repair work in accordance with the state of technology Art. 6 (1) No. 4 Prevention of incorrect behaviour by means of suitable operational and safety instructions Art. 6 (2) Keeping of stocking-lists	4.4.6 Operational control 4.4.2 Training, awareness and competence 4.4.2 b) "Environmental impacts of their activities" 4.4.2 d) "Consequences of departure from specified operating procedures" 4.4.3 a) ''Internal communication'' 4.5.3 Records		**PRODUCTION** • (Legal) framework • Planning • Production • Disruptions of production • Storage and transport **MAINTENANCE**

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3d Safe management of change • Procedures for planning modifications • Design of new installations or processes	Art. 3 (2) Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4) Nature and operation of the installations in the establishment in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equip the establishment with adequate warning, alarm and safety equipment Art. 4 No. 3: Equipping the establishment with reliable measuring and control or regulating devices Art. 4 No. 4: Protection of the safety relevant parts of the establishment from interference by unauthorised persons Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take the necessary technical and organisational safety precautions Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment	4.3.1 Environmental aspects 4.3.2 Legal and other requirements 4.4.6 Operational control 4.4.7 Emergency preparedness and response 4.5.3 Records		**MARKET RESEARCH** **DEVELOPMENT** **NEW CONSTRUCTION** **MAINTENANCE** **PRODUCT HANDLING** • **STORAGE** • **TRANSPORT** • **SALES** • **MONITORING**

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
	Art. 8 (3) Update concept for prevention of major accidents	4.4.6 Operational control		
	Art. 9 (5) Update safety report	4.4.5 Document control 4.5.3 Records		
	Art. 10 (4) Update internal alarm and emergency plans	4.4.7 Emergency preparedness and control		

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3e Planning for emergencies	Art. 3 (3) Precautions, in order to keep the effects of major accidents as small as possible	4.3.2 Legal and other requirements 4.4.1 Structure and responsibility 4.4.7 Emergency preparedness and response		**EMERGENCY MANAGEMENT** **CRISIS MANAGEMENT**
• Identification of foreseeable emergencies	Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities Art. 6 (2): Keep available stocking-lists for hazard prevention Art. 8 Concept for prevention of major accidents, Risk analysis and safety measures taken Art. 9 Safety report pursuant to Annex II No. V			

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
• Preparation, testing and review of emergency plans	Art. 10 (1) No. 1: Drawing up internal alarm and emergency plans Art. 10 (1) No. 2: Supply to the competent authorities the information necessary for drawing up external alarm and emergency plans Art. 10 (3) Regularly instruct personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident and hear their views	4.3.2 Legal and other requirements 4.4.2 Training, awareness and competence 4.4.2 b) "Environmental impacts of their activities" 4.4.2 d) "Consequences of departure from specified operating procedures" 4.4.3 a) ''Internal communication'' 4.4.7 Emergency preparedness and response		

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
	Art. 11 (1) Inform persons who could be affected by a major accident originating in the respective establishment about safety measures and requisite behaviour in the event of a major accident Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority)	4.4.3 a) ''Communication with interested, internal parties'' 4.4.3 b) ''Communication with interested, external parties''		

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3f Monitoring the performance of the SMS • Ongoing assessment of compliance with the objectives • Corrective actions in case of non-compliance • Reporting major accidents or near misses (failure of protective measures) including investigation and follow-up	Art. 9 (5) Review safety report and update if necessary Art. 10 (4) Review and update the internal alarm and emergency plans Art. 11 (2) Review information on safety measures and update if necessary	4.5.2 Nonconformance and corrective and preventive action 4.5.4 Environmental management system audit 4.4.5 Document control 4.5.3 Records		**CONTINUING IMPROVEMENT PROCESS**

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
3g Systematic audit and review • Assessment of the effectiveness and suitability of the mayor-accident prevention policy and the effectiveness and suitability of the SMS • Updating of the SMS • Documentation provided by the senior management of the establishment		4.3.3 Objectives and targets 4.3.4 Environmental management programme(s) 4.4.1 b) "Report of top management" 4.4.5 Document control 4.5.2 Nonconformance and corrective and preventive action 4.5.4 Environmental management system audit 4.6 Management review		(like 3f)

Table 2: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and environmental management system

Changes in Annex III of StörfallV 04/2000	Correlation with individual requirements from StörfallV 04/2000	Correlation with EMS DIN EN ISO 14001		Possible company processes
	Art. 8 (3) Update the concept for prevention of major accidents Art. 9 (5) Update the safety report	4.4.6 Operational 4.4.5 Document control 4.5.3 Records		

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
1. Mayor accident prevention concept – Overall aims – General principles of actions with respect to the control of major-accident hazards • Written form	Art. 3 General obligations of the operator Art. 4 Requirements for the prevention of major accidents Art. 5 Requirements intended to limit the effects of major accidents Art. 6 Additional requirements Art. 7 Notification Art. 8 Major accident prevention policy, concept for prevention of major accidents, taking into account the principles of Annex III	3.1 Occupational safety and health policy 3.9 Occupational safety and health objectives 3.16 Continual improvement 3.5 Occupational safety and health management system documentation	3.1.1 Occupational safety and health policy and aims 3.1.2 Basic procedures 3.7 Documentation and control of documents and records	4.1 Occupational health and safety policy 4.2 Planning 4.2.1 General 4.2.2 Risk assessment 4.2.3 Legal and other requirements 4.2.4 Occupational health and safety management arrangements	**Company policy, principles, aims**
2. Safety management system (SMS); general requirements	Art. 9 (1) No. 1 Implementation of the major accident prevention concept and application of an SMS in accordance with the principles set out in Annex III	3.5 Occupational safety and health management system documentation 3.9 Occupational safety and health objectives	3.1.1 Occupational safety and health policy and aims 3.1.2 Basic procedures	4.01 General 4.3.4 Occupational health and safety management system documentation	**Management system General description**

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3a Organisation and personnel • Roles and responsibilities		3.3 Responsibility and accountability	3.3.1 Organisational structures	4.3.1 Structure and responsibility 4.3.6 Operational control	**BASIC ORGANISATION** • Normal organisation • Legally required organisation • Emergency organisation • Crisis organisation (Provide resources, guideline delegation, etc.)
	Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities	3.3 Responsibility and accountability	3.2 Responsibility, tasks and authority		
	Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority)	3.10.3.1 b) ''Communication and co-operation with the authority''	3.4 Internal and external flows of information and co-operation	4.3.3 Communications	**COMMUNICATION** • internal • external

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
	Art. 12 (1) No. 2: Assign a person or staff unit to be responsible for limiting the impacts of major accidents	3.3 Responsibility and accountability	3.2 Responsibility, tasks and authority 3.6.4. Regulations pertaining to operational disturbances and emergencies		
• Training requirements	Art. 6 (1) No. 4: Training of personnel in proper operational and safety instructions	3.4 Competence and training 3.10.3.1 d) Emergency prevention, preparedness and response; training	3.6.6 Training	4.3.2 Training, awareness and competence 4.3.3 Communications	**TRAINING** • Identify training needs/requirements • Plan training • Carry out training • Assess training success
	Art. 10 (3) Instruction of personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident	3.10.3.1 d) Emergency prevention, preparedness and response; training	3.6.4 Regulations pertaining to operational disturbances and emergencies	4.3.2 Training, awareness and competence 4.3.3 Communications	
• Involvement of employees	Art. 10 (3) Before drawing up the internal alarm and emergency plans the operator shall inform the employees of the establishment about the proposed content and hear their views	3.2 Worker participation	3.3.2 Co-operation and rights/obligations of employees	4.3.2 Training, awareness and competence 4.3.3 Communications	

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
• Involvement of subcontractors	Art. 6 (1) No. 4: Prevention of incorrect behaviour - in cases when outside personnel is in the establishment - by means of suitable operational and safety instructions	3.10.5 Contracting	3.6.5 Planning and purchasing 3.6.6 Training	4.3.6 Operational control	**PURCHASING** • Prepare requirements for ordering process • Obtain and review offers • Select suppliers (assess suppliers) • Order • Receive and check product/service • Handover to orderer for acceptance/checking
	Art. 10 (3): Instruction in rules for behaviour during major accidents, for cases when outside personnel is in the establishment	3.10.5 Contracting	3.6.6 Training		

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3b Identification and evaluation of major accident hazards • Adoption and implementation of procedures for systematically identifying mayor accident hazards arising from normal and abnormal operation • Assessment of probability and severity of mayor accident hazards	Art. 3 (2): Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4): Nature and operation of the installations in keeping with the state of the art of safety technology	3.7 Initial review 3.8 System planning, development and implementation 3.10.1 Prevention and control measures 3.10.1 Prevention and control measures	3.6.1 Identification and description of activities, procedures and processes 3.6.2 Risk assessment 3.6.3 Measures to minimise hazards and risks 3.6.4 Regulations pertaining to operational disturbances and emergencies 3.6.2 Risk assessment 3.6.3 Measures to minimise hazards and risks	4.2.2 Risk assessment 4.2.3 Legal and other requirements 4.3.7 Emergency preparedness and response 4.2.3 Legal and other requirements 4.3.7 Emergency preparedness and response	**MARKET RESEARCH** **DEVELOPMENT** **NEW CONSTRUCTION** **PRODUCTION** • (Legal) framework • Planning • Production • Disruptions of production • Storage and transport **MAINTENANCE** **DECOMMISSIONING** **PRODUCT HANDLING** • STORAGE • TRANSPORT • SALES • MONITORING

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
	Art. 4 No. 1: Measures to prevent fires and explosions	3.10.3 Emergency prevention, preparedness and response	3.6.4 Regulations pertaining to operational disturbances and emergencies		
	Art. 4 No. 2: Equipping the establishment with adequate warning, alarm and safety equipment	3.10.1 Prevention and control measures	3.6.3 Measures to minimise hazards and risks		
	Art. 4 No. 3: Equipping the installations of the establishment with reliable measuring and control or regulating devices	3.10.1 Prevention and control measures			
	Art. 4 No. 4: Protection of safety-relevant parts of the establishment from interference by unauthorised persons				

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
	Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take technical and organisational safety precautions		3.6.5 Planning and purchasing 3.6.3 Measures to minimise hazards and risks		
	Art. 8 (1) Concept for prevention of major-accidents	3.10.3 Emergency prevention, preparedness and response	3.6.2 Risk assessment	4.3.7 Emergency preparedness and response	
	Art. 9 Safety report pursuant to Annex II No. IV	3.10.3 Emergency prevention, preparedness and response	3.6.3 Measures to minimise hazards and risks	4.3.7 Emergency preparedness and response	
	Art. 10 Alarm and emergency plans pursuant to Annex IV Nos. 3 and 4 • Internal alarm and emergency plans • Provide information for external alarm and emergency plans	3.10.3 Emergency prevention, preparedness and response	3.6.4 Regulations pertaining to operational disturbances and emergencies	4.3.7 Emergency preparedness and response	

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3c Operational control • Procedures and instructions for safe operation • Maintenance • Temporary shutdowns	Art. 3 (4): Nature and operation in keeping with the state of the art of safety technology Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment Art. 6 (1) No. 2: Execution of maintenance and repair work in accordance with the state of technology Art. 6 (1) No. 4 Prevention of incorrect behaviour by means of suitable operational and safety instructions Art. 6 (2) Compiling of stocking-lists	3.10 Hazard prevention 3.15 Preventive and corrective action 3.6 Communication 3.5 Occupational safety and health management system documentation 3.4 Competence and training	3.6.3 Measures to minimise hazards and risks 3.8.1 Monitoring and measurement 3.4 Internal and external flows of information and co-operation 3.7 Documentation and management of documents and records 3.6.6 Training	4.2.2 Risk assessment 4.2.3 Legal and other requirements 4.3.6 Operational control 4.4.1 Monitoring and measurement 4.3.2 Training, awareness and competence 4.3.3 Communications	**PRODUCTION** • (Legal) framework • Planning • Production • Disruptions of production • Storage and transport **MAINTENANCE**

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3d Safe management of change • Procedures for planning modifications • Design of new installations or processes	Art. 3 (2) Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4) Nature and operation of the installations in the establishment in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equip the establishment with adequate warning, alarm and safety equipment Art. 4 No. 3: Equipping the establishment with reliable measuring and control or regulating devices Art. 4 No. 4: Protection of the safety relevant parts of the establishment from interference by unauthorised persons	3.10.1 Prevention and control measures 3.10.2 Management of change 3.10.3 Emergency prevention, preparedness and response 3.4 Competence and training	3.3.1 Organisational structures 3.5 Legal and other requirements 3.6.3 Measures to minimise hazards and risks 3.6.4 Regulations pertaining to operational disturbances and emergencies	4.2.2 Risk assessment 4.3.6 Operational control 4.2.2 Risk assessment 4.2.3 Legal and other requirements 4.4.1 Monitoring and measurement	**MARKET RESEARCH** **DEVELOPMENT** **NEW CONSTRUCTION** **MAINTENANCE** **PRODUCT HANDLING** • **STORAGE** • **TRANSPORT** • **SALES** • **MONITORING**

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
	Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take the necessary technical and organisational safety precautions	3.10 Hazard prevention	3.6.3 Measures to minimise hazards and risks	4.4.1 Monitoring and measurement	
	Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment	3.11 Performance monitoring and measurement	3.8.1 Monitoring and measurement	4.4.1 Monitoring and measurement	
	Art. 8 (3) Update concept for prevention of major accidents		3.7 Documentation and control of documents and records	4.3.5 Document control 4.4.3 Records	
	Art. 9 (5) Update safety report	3.5 Occupational safety and health management system documentation	3.7 Documentation and control of documents and records	4.3.5 Document control 4.4.3 Records	
	Art. 10 (4) Update internal alarm and emergency plans	3.5.2 b) Update OSH-MS documentation	3.7 Documentation and control of documents and records	4.3.5 Document control 4.4.3 Records	

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3e Planning for emergencies	Art. 3 (3) Precautions, in order to keep the effects of major accidents as small as possible	3.3.2 b) ''Responsibility, accountability and authority""	3.6.3 Measures to minimise hazards and risks	4.2.3 Legal and other requirements	**EMERGENCY MANAGEMENT**
		3.10.3 Emergency prevention, preparedness and response	3.6.4 Regulations pertaining to operational disturbances and emergencies	4.3.7 Emergency preparedness and response	**CRISIS MANAGEMENT**
				4.2.2 Risk assessment	
• Identification of foreseeable emergencies	Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities	3.3 Responsibility and accountability	3.2 Responsibility, tasks and authority		
			3.6.4 Regulations pertaining to operational disturbances and emergencies		
	Art. 6 (2): Keep available stocking-lists for hazard prevention	3.5 Occupational safety and health management system documentation			
	Art. 8 Concept for prevention of major accidents, Risk analysis and safety measures taken	3.10.1 Prevention and control measures	3.6 Integration of occupational safety and health within operational procedures	4.2.2 Risk assessment	
	Art. 9 Safety report pursuant to Annex II No. V	3.10.1 Prevention and control measures			

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
• Preparation, testing and review of emergency plans	Art. 10 (1) No. 1: Drawing up internal alarm and emergency plans Art. 10 (1) No. 2: Supply to the competent authorities the information necessary for drawing up external alarm and emergency plans Art. 10 (3) Regularly instruct personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident and hear their views	3.2 Worker participation 3.10.3.1 d) Emergency prevention, preparedness and response/Training	3.4 Internal and external flows of information and co-operation 3.6.4 Regulations pertaining to operational disturbances and emergencies 3.6.6 Training	4.2.3 Legal and other requirements 4.3.2 Training, awareness and competence 4.3.3 Communications 4.3.7 Emergency preparedness and response	
	Art. 11 (1) Inform persons who could be affected by a major accident originating in the respective establishment about safety measures and requisite behaviour in the event of a major accident	3.6 Communication	3.4 Internal and external flows of information and co-operation	4.3.3 Communications	
	Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority)	3.10.3.1 b) Emergency prevention, preparedness and response / Communication and co-operation with the authority	3.4 Internal and external flows of information and co-operation	4.3.3 Communications	

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3f Monitoring the performance of the SMS • Ongoing assessment of compliance with the objectives • Corrective actions in case of non-compliance • Reporting major accidents or near misses (failure of protective measures) including investigation and follow-up		3.11 Performance monitoring and measurement 3.13 Audit 3.15 Preventive and corrective action	3.8 Determination and assessment of results; improvement	4.3.5 Document control 4.4.1 Monitoring and measurement 4.4.2 Corrective action 4.4.3 Records 4.4.4 Audit	**CONTINUING IMPROVEMENT PROCESS**
	Art. 9 (5) Review safety report and update if necessary	3.5.2 OSH-MS documentation	3.7 Documentation and control of documents and records	4.4.3 Records	
	Art. 10 (4) Review and update the internal alarm and emergency plans	3.5.2 OSH-MS documentation			
	Art. 11 (2) Review information on safety measures and update if necessary	3.11 Performance monitoring and measurement			

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
3g Systematic audit and review • Assessment of the effectiveness and suitability of the mayor-accident prevention policy and the effectiveness and suitability of the SMS • Updating of the SMS • Documentation provided by the senior management of the establishment	Art. 8 (3) Update the concept for prevention of major accidents	3.11 Performance monitoring and measurement 3.13 Audit 3.14 Management review 3.5 Occupational safety and health management system documentation	3.8.1 Review and measurement 3.8.2 Correction of detected deviations and continuous improvement 3.8.3 Internal system and compliance audits 3.8.4 Review of the OSH-MS 3.7 Documentation and control of documents and records	4.2.2 Risk assessment 4.2.3 Legal and other requirements 4.2.4 Occupational health and safety management arrangements 4.3.5 Document control 4.4.1 Monitoring and measurement 4.4.2 Corrective action 4.4.3 Records 4.4.4 Audit 4.5 Management review 4.3.5 Document control 4.4.3 Records	(like 3f)

Table 3: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and occupational safety management system

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000	Correlation with ILO Guidelines on OSH-MS	Correlation with LASI Specification LV21	Correlation with SMS British Standard 8800	Possible company processes
	Art. 9 (5) Update the safety report	3.5.2 b) ''OSH-MS documentation''	3.7 Documentation and control of documents and records	4.3.5 Document control 4.4.3 Records	
	Art. 6 (1) No. 4: Proof that personnel has been trained in operational and safety instructions	3.5.5 OSH-MS documentation/records	3.6.6 Training	4.3.2 Training, awareness and competence	
	Art. 10 (3) Proof that personnel has been instructed in rules for their behaviour contained in the internal alarm and emergency plans for a major accident	3.5.5 OSH-MS documentation/records	3.6.4 Regulations pertaining to operational disturbances and emergencies 3.6.6 Training	4.3.2 Training, awareness and competence	
	Art. 12 (2) No. 2: Documentation on the execution of monitoring and regular maintenance of the installations Art. 12 (2) No. 4: Documentation on the execution of the functional testing of the warning, alarm and safety systems Art. 12 (2) No. 3: Documentation on the execution of the safety relevant maintenance and repair work	3.5.5 OSH-MS documentation/records	3.7 Documentation and control of documents and records	4.4.3 Records	

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
1. Mayor accident prevention concept – Overall aims – General principles of actions with respect to the control of major-accident hazards • Written form	Art. 3 General obligations of the operator Art. 4 Requirements for the prevention of major accidents Art. 5 Requirements intended to limit the effects of major accidents Art. 6 Additional requirements Art. 7 Notification Art. 8 Major accident prevention policy, concept for prevention of major-accidents, taking into account the principles of Annex III			1.2 Safety principles, aims and programme
2. Safety management system (SMS); general requirements	Art. 9 (1) No. 1 Implementation of the major accident prevention concept and application of an SMS in accordance with the principles set out in Annex III			2. Safety management system

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3a Organisation and personnel • Roles and responsibilities	Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority) Art. 12 (1) No. 2: Assign a person or staff unit to be responsible for limiting the impacts of major accidents			1. Responsibility of management 1.1 Overall responsibility of management 1.3 Safety organisation 1.4 Delegation 1.6 Resources and personnel 19. Communication with external organisations and the public

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
• Training requirements	Art. 6 (1) No. 4: Training of personnel in proper operational and safety instructions Art. 10 (3) Instruction of personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident			18. Training, competence and awareness
• Involvement of employees	Art. 10 (3) Before drawing up the internal alarm and emergency plans the operator shall inform the employees of the establishment about the proposed content and hear their views			18. Training, competence and awareness
• Involvement of subcontractors	Art. 6 (1) No. 4: Prevention of incorrect behaviour - in cases when outside personnel is in the establishment - by means of suitable operational and safety instructions Art. 10 (3): Instruction in rules for behaviour during major accidents, for cases when outside personnel is in the establishment			7. Safety requirements for external services 3. Safety requirements in contracts

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3b Identification and evaluation of major accident hazards • Adoption and implementation of procedures for systematically identifying mayor accident hazards arising from normal and abnormal operation • Assessment of probability and severity of mayor accident hazards	Art. 3 (2): Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4): Nature and operation of the installations in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equipping the establishment with adequate warning, alarm and safety equipment Art. 4 No. 3: Equipping the installations of the establishment with reliable measuring and control or regulating devices Art. 4 No. 4: Protection of safety-relevant parts of the establishment from interference by unauthorised persons			4. Safety requirements in design, planning, construction and erection 6. Safety requirements in purchasing 13. Operational disturbances and emergencies

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
	Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take technical and organisational safety precautions Art. 8 (1) Concept for prevention of major-accidents Art. 9 Safety report pursuant to Annex II No. IV Art. 10 Alarm and emergency plans pursuant to Annex IV Nos. 3 and 4 • Internal alarm and emergency plans • Provide information for external alarm and emergency plans			

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3c Operational control • Procedures and instructions for safe operation • Maintenance • Temporary shutdowns	Art. 3 (4): Nature and operation in keeping with the state of the art of safety technology Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment Art. 6 (1) No. 2: Execution of maintenance and repair work in accordance with the state of technology Art. 6 (1) No. 4 Prevention of incorrect behaviour by means of suitable operational and safety instructions Art. 6 (2) Keeping of stocking-lists			8. Identification and labelling 9. Specified operation 10. Monitoring and measurement 12. Safety and test status 15. Storage and transport

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3d Safe management of change • Procedures for planning modifications • Design of new installations or processes	Art. 3 (2) Prevent major accidents, taking into account any operational hazard sources, environmental hazard sources and interference by unauthorised persons Art. 3 (4) Nature and operation of the installations in the establishment in keeping with the state of the art of safety technology Art. 4 No. 1: Measures to prevent fires and explosions Art. 4 No. 2: Equip the establishment with adequate warning, alarm and safety equipment Art. 4 No. 3: Equipping the establishment with reliable measuring and control or regulating devices Art. 4 No. 4: Protection of the safety relevant parts of the establishment from interference by unauthorised persons Art. 5 (1), No. 2: Equip the installations in the establishment with the necessary safety equipment and take the necessary technical and organisational safety precautions			4. Safety requirements in design, planning, construction and erection 6. Safety requirements in purchasing 13. Operational disturbances and emergencies

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
	Art. 6 (1) No. 1: Inspection of construction and operation of safety-relevant parts of the installations, continuous monitoring and regular service the installations in the establishment Art. 8 (3) Update concept for prevention of major accidents Art. 9 (5) Update safety report Art. 10 (4) Update internal alarm and emergency plans			

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3e Planning for emergencies • Identification of foreseeable emergencies	Art. 3 (3) Precautions, in order to keep the effects of major accidents as small as possible Art. 5 (2): Commission a person or staff unit to advise the authorities responsible for preventing hazards and the emergency services and announce this person or staff unit to the authorities Art. 6 (2): Keep available stocking-lists for hazard prevention Art. 8 Concept for prevention of major accidents, Risk analysis and safety measures taken Art. 9 Safety report pursuant to Annex II No. V			13. Operational disturbances and emergencies

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
• Preparation, testing and review of emergency plans	Art. 10 (1) No. 1: Drawing up internal alarm and emergency plans Art. 10 (1) No. 2: Supply to the competent authorities the information necessary for drawing up external alarm and emergency plans Art. 10 (3) Regularly instruct personnel in rules for their behaviour which are contained in the internal alarm and emergency plans for a major accident and hear their views Art. 11 (1) Inform persons who could be affected by a major accident originating in the respective establishment about safety measures and requisite behaviour in the event of a major accident Art. 12 (1) No. 1: Establish and maintain a protected communications link, suitable for forwarding information to the competent authority (at the request of the authority)			19. Communication with external organisations and the public 18. Training, competence and awareness

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3f Monitoring the performance of the SMS • Ongoing assessment of compliance with the objectives • Corrective actions in case of non-compliance • Reporting major accidents or near misses (failure of protective measures) including investigation and follow-up	Art. 9 (5) Review safety report and update if necessary Art. 10 (4) Review and update the internal alarm and emergency plans Art. 11 (2) Review information on safety measures and update if necessary			5. Administration and control of documents and data 10. Monitoring and measurement 11. Monitoring of test equipment 14. Corrective and preventive measures 20. Statistical methods

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual requirements of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
3g Systematic audit and review • Assessment of the effectiveness and suitability of the mayor-accident prevention policy and the effectiveness and suitability of the SMS • Updating of the SMS • Documentation provided by the senior management of the establishment	Art. 8 (3) Update the concept for prevention of major accidents Art. 9 (5) Update the safety report Art. 6 (1) No. 4: Proof that personnel has been trained in operational and safety instructions Art. 10 (3) Proof that personnel has been instructed in rules for their behaviour contained in the internal alarm and emergency plans for a major accident			1.5 Management review 5. Administration and control of documents and data 16. Administration and control of reports and safety records 17. Safety audits 20. Statistical methods

Table 4: Safety management system, pursuant to the Hazardous Incident Ordinance (StörfallV), and safety management system pursuant to UBA Research Report 10409422

Requirements of Annex III of StörfallV 04/2000	Correlation with individual require-ments of StörfallV 04/2000			Company processes pursuant to UBA-FB 10409422 (Chap.-No. from Handbook)
	Art. 12 (2) No. 2: Documentation on the execution of monitoring and regular maintenance of the installations Art. 12 (2) No. 4: Documentation on the execution of the functional testing of the warning, alarm and safety systems Art. 12 (2) No. 3: Documentation on the execution of the safety relevant maintenance and repair work			

Annex

1. Membership directory

2. Dates of scheduled meetings

1. Membership directory

The SFK's MANAGEMENT SYSTEMS working group is composed of the following members (last revision: April 2001):

Dipl.-Chemiker Waldemar Bahr	Mining, Chemical and Energy Industrial Union (IG BCE)
Dr. Ludwig Glatzner	BUND e. V.
Dipl.-Ing. Peter Guterl	Berufsgenossenschaft der Chemischen Industrie (BG Chemie)
Dr. Jürgen Herrmann (Chairman)	VEBA OIL Refining & Petrochemicals GmbH
Dipl.-Ing. Werner Kraus	Federal Institute for Materials Research and Testing (BAM)
Dr.-Ing. Michael Nitsche	Federal Environmental Agency (UBA)
Dipl.-Ing. Klaus-Dietrich Paul	RWTÜV Anlagentechnik GmbH
Dr. Karl-Ernst Poppendick	Federal Institute for Occupational Safety and Health (FIOSH - BAuA)
Dipl.-Ing. Birgit Richter	Landesumweltamt NRW (State Environmental Agency of NRW)
Dr. Wolfgang Viefers	Bayer AG

Office of the SFK:

Dr. Dieter Lauterborn-Gielow	GFA-Infrastruktur und Umweltschutz GmbH
Dipl.-Ing. Michael Eifländer	GFA-Infrastruktur und Umweltschutz GmbH

2. Dates of scheduled meetings

Chronological list of the MANAGEMENT SYSTEMS working group's meetings with relevance to the production of the present guideline:

10th meeting	18 May 2000	GRS / Cologne
11th meeting	10 July 2000	GRS / Cologne
12th meeting	12 September 2000	GRS / Cologne
13th meeting	20 November 2000	GRS / Cologne
14th meeting	4 May 2001	GFA-Umwelt / Bonn

GFA - Infrastruktur und Umweltschutz GmbH

Geschäftsstelle
Störfall-Kommission und
Technischer Ausschuss für Anlagensicherheit

Königswinterer Str. 827
D-53227 Bonn

Telephone 49-(0)228-90 87 34-0
Telefax 49-(0)228-90 87 34-9
E-mail sfk-taa@gfa-umwelt.de