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Possible Implementation Solutions for the New Safety Management Systems Related Legislative Provisions of the Seveso III Directive*

The key element of the major accident prevention system is the operation of the safety management system. The entry into force of the Seveso III Directive modified the safety management system related legal provisions. After overviewing the changes, the author provides in his article some practical enforcement opportunities of the modified provisions based on experiences of national and international authorities.
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Introduction

The directive 2012/18/EU of the European Parliament and Council (Directive) on the management of the hazards of major accidents involving dangerous substances and on the modification and latter cancelation of directive 96/82/EC, Par. 8. Clause (5) requires the operators of hazardous establishments to operate, depending on the status of the establishment, a safety management or a management system. The goal of the operation of both types of systems is the implementation of the safety policy of the operator aimed at the prevention of major accidents and at the mitigation of risks.

The safety management system is a "quality management system" not based on voluntary commitment but based on the fulfilment of a statutory obligation [1] and by the operation of the safety management system proper safety from major accidents can be achieved and maintained. The primary goal of the safety management system is the formal regulation of the company activities in order to establish and maintain safe operation and

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to continuously improve the safety performance and to support the culture of safety. The safety management system offers a structured approach for the implementation of all organizational actions within the company that are needed for the achievement of the safety performance desired.

In view of the fact that the analyses of the Major Accidents Hazards Bureau at the Community Research Center of the European Commission [2] proved that 85% of the accidents can be traced back to human error and to the deficiencies of the safety management system, it can be stated that a safety management system operated efficiently and effectively is one of the most important tools in the prevention of major accidents related to hazardous substances.

All companies should treat safety management as part of the overall corporate governance [3] in view of the fact that there is a clear interrelation between safely operating companies and well-managed operation. The safety management system shall be based on the safety policy and shall set goals on a level the company deems appropriate for its business activity and the safety considerations and requirements shall be aligned with the facilities of the company.

According to the Directive the member states shall require operators to elaborate a document that determines their major accident prevention policy (MAPP) and ensures the appropriate implementation of such policy. The objectives of the operator aimed at the prevention of major accidents shall by means of appropriate tools, organizations and management systems guarantee the high-level protection of man and environment. [4] According to a potential definition [5] the management system is a system of tools enabling us to do in the right time what has to be done. The most important subsystems are: men; actions; procedures; training and preparation.

In line with the requirements of the Directive, the safety management system established by the operator shall address the following substantive elements.

- organization and personnel,
- the identification and evaluation of the hazards of major accidents,
- system of operational norms,
- management of changes,
- emergency planning,
- performance assessment (monitoring),
- audit and review.

Annex III of the Directive covers the regulations regarding safety management systems in detail. By the transposition of the Directive into the legal regulations of Hungary the requirements regarding safety management systems have been modified significantly. The changed regulations regarding the substantive elements and the related implementation possibilities are as follows:

Organization and Personnel

In the Directive, Annex III, section b) sub-section i. the following highlighted changes have been made: "organization and personnel — the roles and responsibilities of personnel involved in the management of major hazards at all levels in the organization, *together with the measures taken to raise awareness of the need for continuous improvement.* The identification of training needs of such personnel and the provision of the training so identified. The involvement of employees and of subcontracted personnel working in the establishment *which are important from the point of view of safety."*

The structure of the safety management system shows a regulation loop containing feedbacks as well. In the main accident prevention policy the relationship (commitment) of the operators with the prevention of major accidents and with the mitigation of consequences is determined and then an appropriate management organization is set up. For the implementation of the accident prevention policy, detailed implementation plans and performance norms shall be elaborated and the methods needed for the measurement, control and auditing of the system shall be established. From this later activity, for the continuous improvement, feedback is established to the main accident prevention policy and to the elements of organization and implementation. [6]

The goal of the modification affecting these substantive elements is to make the establishment of actions aimed at increasing the awareness related to the continuous improvement of the safety management system mandatory. Commitment to continuous improvement is of vital importance. This includes the permanent improvement of the main objectives, the systems and the risk management techniques. [7] One possibility of the practical implementation of the new regulation element is the establishment of procedures for the regular involvement of the employees and subcontractors into the safety management system, further possibilities are the various passive and active actions aimed at increasing awareness.

For the continuous improvement of safety norms, it is necessary to involve also the employees who are highly experienced in the operation of the installation involving hazardous substances. Among the employees who can be involved in this regular polling by questionnaires, posting "idea boxes", establishment of a web platform for anonymous entries, or the establishment of a central email address operated with the same purpose, and the improvement of related intercompany communication processes. It is important that the necessary resources for the evaluation of the improvement proposals received and for reporting about them to the management are available and the operator shall integrate the proposals with potential improvement into the safety management system and transpose them into the everyday operating practice.

In the frame of the active actions aimed at increasing awareness, mostly procedures related to the maintenance and improvement of the educational system can be highlighted.

The training of employees is one of the corner stones of the efficiency of the safety management system. Experience shows that safety training courses are more efficient if conducted by Health, Safety and Environment (HSE) coordinators appointed at the individual hazardous establishments instead of local managers. People in charge of these tasks can contribute significantly, by means of the continuous monitoring of safety, to the continuous improvement of the safety management system. The process safety awareness of the operator and of the employees of the contractual partners is of key importance. In addition operators have to keep track of their organization procedures and of the function of the training of their employees and of the subcontractor activities. [8]

Another possibility is to visualize the topic of safety at company meetings dedicated to other topics and to conduct safety inspections (involving foremen or higher management levels) in such a way as to discuss non-conformities and deficiencies immediately after their identification with the employees concerned and ask for their opinion to word solution proposals on the spot to avoid the re-occurrence of undesired events.

In addition to active information it is important to post various posters, awareness-raising signs in the working area. By using these tools, the most important pieces of information related to safety can be communicated without major financial/human resources to the employees concerned.

The Identification and Evaluation of the Hazards of Major Accidents

The relevant legal environment is in the Directive, Annex III, section b), sub-section ii. as follows: "identification and evaluation of major hazards – adoption and implementation of procedures for systematically identifying major hazards arising from normal and abnormal operations *including subcontracted activities where applicable* and the assessment of their likelihood and severity."

With regard to this substantive element the change of the requirements of legal regulations is the acceptance and implementation of procedures serving for the systematic identification of major hazards resulting from activities carried out by subcontractors. In connection with this detailed implementation, possibilities are described in the next subheading.

Operating Norms

In the Directive, Annex III section b) sub-section iii. the following highlighted changes have been made: "operational control – adoption and implementation of procedures and

instructions for safe operation, including maintenance of plant, processes and equipment and for alarm management and temporary stoppages; taking into account available information on best practices for monitoring and control, with a view to reducing the risk of system failure; management and control of the risks associated with ageing equipment installed in the establishment and corrosion; inventory of the establishment's equipment, strategy and methodology for monitoring and control of the condition of the equipment; appropriate follow-up actions and any necessary countermeasures."

The technological instructions for the manufacturing, storing and other processes involving hazardous substances have been worded on the basis of the aspects of economical operation. The analysis of risk sources carried out in the frame of the preparation of the safety report unveils safety-critical operations, technological elements, equipment, operating modes etc. For such critical parts a technological documentation shall be complemented and the conditions of safe operation shall be integrated into it. This complement shall cover not only production in normal operation, but also all operating modes different from this: startup, shutdown, repair and maintenance. It shall also cover the response to incidents. [9]

With regard to these substantive elements the goal of the modifications is to continuously improve the operating norms being part of the safety management system by the integration of the available best practices and of the operating experiences, the listing of the actions related to the signaling and management of technological hazards and of the related resources in the operating norms and putting subcontractor activities into the focus, and the follow-up of the condition of equipment that are critical in terms of major accidents involving hazardous substances and the implementation of actions needed (if any). For the practical implementation of the new regulation elements the following options are available.

Operation based on the best practice available shall be listed among the safety objectives. Of course the allocation of the relevant responsibilities, tasks and resources is inevitable for the successful achievement of the goals. An acceptable practical solution for the achievement of this goal is for example, if the company reviews at least once a year the best practices, various instructions (if any) published by industry associations, international professional forums or competent authorities. The company establishes information sharing processes about the best practices available with sites operating similar technologies and takes action to introduce solutions that can be applied at the plant concerned. In line with the relevant provisions of the Directive, particular attention shall be paid to the application of best practices related to the follow-up (safety-critical changes, safety performance) and checking (being familiar with the norms, understanding and implementing them, safety performance).

It is expedient to implement the development of the operating norms in the light of the Directive, in line with the following provisions.

In the course of the analysis of danger sources from the production, storing and other processes related to hazardous substances safety critical elements are selected. When establishing the system of operational norms the conditions of safe operation shall be added to the technological instructions of the aforementioned processes. [10]

In the system of operational norms the potential modes of the alarms and management of dangerous technological situations within the hazardous establishment, along with the related resources shall be designated.

The Directive places particular emphasis on the management, monitoring of activities carried out by external partners at the site, in this way the operator has to establish procedures in connection with the activities of subcontractors that can include, among others, the selection process of subcontractors (including the selection criteria), the permit to work and monitoring activities and that can furthermore cover the handover-takeover of the site, the verification and approval after the work, and the evaluation of the safety performance of the subcontractors and external partners.

When establishing the system of norms special attention shall be paid to subcontractors who carry out activities in the territory of the hazardous establishment based on a permanent order, e.g. external partners in charge of security or cleaning services. In case of certain sites, outside of the working hours in particular, security personnel play a key role in the prevention of major accidents involving hazardous substances and in the mitigation of their consequences, by recognizing unexpected events (e.g. initial fires, other abnormal conditions) that trigger major accidents, by starting the first response activities and alarming external response teams and those endangered. Because of this the addition of the necessary safety information (e.g. the location of hazardous installations/hazardous substances within the site, potential major accident scenarios and signs implying the occurrence of such scenarios, behavior rules to be followed, updated alarming and notification orders) is essencial to the relevant instructions (e.g. instructions for the guards).

As part of the system of norms of the establishment the elaboration of a strategy and methodology used for the inspection and follow-up of the condition of safety critical technological equipment related to major accidents involving hazardous substances is of key importance. The operator shall pay proper attention to the implementation of follow-up actions and of counter-actions if needed. A practical implementation possibility is for example the determination of the sustainability objectives of the technical safety and the selection of the related procedures for the regulation of the activities related to the periodical inspection, technical safety review, calibration and maintenance of the equipment concerned and the allocation of the resources required for the completion of these tasks.

Hazardous technologies usually include the following safety critical elements listed below:

- atmospheric, vacuum and cryogenic tanks;
- process equipment like columns, reactors, heat exchangers, boilers, pumps, compressors;
- technological pipelines and their elements (e.g. valves, fittings, automated fittings, control systems with instruments, non-return valves, safety valves),
- emergency energy supply systems (including the emergency power supply to emergency alarming and communication systems),
- handling tools used for hazardous substances (e.g. lifting equipment, cranes, forklift trucks).

The maintenance program shall also embrace safety critical instruments. The functional ability of the tools, safety-relevant alarm and shutdown systems shall be periodically inspected.

The related means of active and passive protection are typically:

- pressure relief and draining systems (including the emergency draining tanks and retaining walls as well);
- emergency systems (e.g. flares, gas purifiers, extinguishing systems etc.);
- shutdown systems (for custom-built equipment and for the whole establishment)
- alarms and automatic switch-offs (releases)
- fire alarm- and prevention systems (e.g. cooling water etc.);
- hazardous liquid and gas detection systems (for highly flammable and/or toxic substances);
- emergency services and the related portable equipment.

The operator has to demonstrate:

- the existence of a criteria system for the identification, classification and management of safety critical elements;
- the existence of maintenance, periodical inspection and testing programs, the detailed contents of which were determined in consideration of the following factors:
  - the results of the analysis of major accident hazards and risks related to hazardous substances,
  - the reliability, life cycle or failure rate of the equipment concerned,
  - the relevant manufacturer's instructions,
  - operating experiences,
  - the aforementioned points determined on the basis of the preliminary testing and inspection results, subjecting the equipment to periodical inspections;

- the existence of a registration system related to maintenance and other interventions, by means of "equipment data sheets" and maintenance records (electronic or hardcopy). With this method test results can be followed, it will be possible to evaluate the improvement process and non-conformities can be identified in the course of the inspection and maintenance activities. The scheduling of interventions in line with the current needs of the facilities becomes possible. The records mentioned can be used as proof for the evaluation of the safety performance.

Change Management

The relevant regulation environment is in the Directive, Annex III, section b), sub-section iv.: "management of change – adoption and implementation of procedures for planning modifications to, or the design of new installations, processes or storage facilities".

With regard to this substantive element the requirements of the legal regulation remain unchanged.

At the same time it is necessary to address the definition of the terms used below, as being familiar with them is indispensable on one hand for the evaluation of the necessity of the out-of-turn review procedure, on the other hand for the determination of the safety-critical elements mentioned in the previous section.

The safety critical equipment or tool is:

- if their inappropriate function, their becoming inoperative or the loss of their mechanical integrity can be the direct or indirect reason for a major accident,
- if their inappropriate function or their becoming inoperative prevents or makes the detection of a major accident, immediate intervention, the efficient mitigation of the consequences, or the emergency management and communication impossible.

Practical examples of safety critical equipment are included in the aforementioned list, at the same time also individual protective equipment determined in the course of the internal emergency planning also belong here.

The safety critical job is, where:

- the activity carried out directly or indirectly influences the operation of safety critical equipment,
- tasks affecting the function of safety-critical equipment are completed or related decisions are made, or where in the job description an activity qualified as important in terms of safety or related tasks are listed.

A practical example for this is e.g. the technological personnel being in charge of the operation of safety-critical equipment, the managers of hazardous establishments, including foremen, plant managers, the personnel in charge of maintenance, and of the implementation of the internal emergency plan. This definition covers the people in charge of the management and implementation of the tasks related to the prevention of major accidents involving the hazardous substances listed in the safety management system, to the mitigation of harmful effects and response.

The safety critical organizational change is: a major change in the organizational structure affecting safety critical jobs, resulting in the termination, merger of such jobs or in the creation of new jobs.

Such change can be practically the outsourcing of maintenance activities performed by the workers of the establishment to an external company or in the field of internal emergency planning the creation or termination of the fire brigade of the plant.

Performance Tracking, Audits and Management Reviews

In the Directive, Annex III, section b) sub-section v. the following highlighted changes have been made: "monitoring performance – adoption and implementation of procedures for the ongoing assessment of compliance with the objectives set by the operator's MAPP and safety management system, and the mechanisms for investigation and taking corrective action in case of non-compliance. The procedures shall cover the operator's system for reporting major accidents or 'near misses', particularly those involving failure of protective measures and their investigation and follow-up on the basis of lessons learnt. The procedures could also include performance indicators such as safety performance indicators (SPIs) and/or other relevant indicators."

The review is a procedure of basic importance that allows to decide whether the safety management system is suitable for the activity elaborated for the prevention of major accidents and for the realization of the goals set. [11] In other words, the review is nothing but the investigation of the results unveiled during the audit pertaining to the conformity with the requirements with the goal to determine the direction and extent of the further improvement of the system and the degree of conformity and the tendency of change.

With regard to these substantive elements the goal of modifications is to implement the recommendations and corrective actions related to the continuous improvement of the safety management system, to keep track of and evaluate the safety performance, resp. and to make it mandatory to investigate unexpected events that can be traced back to the implementation disturbances of the safety management system and to take the actions needed. For the practical implementation of the new regulation elements the options detailed below are available.

For the maintenance and continuous improvement of the appropriate safety level of the establishment it is indispensable to apply a systematic management system which guides the operator step-by-step through the development cycle, by activating the individual elements of the safety management system in the right sequence and at the right time in the process. Among others the so-called PDCA (Plan), (Do), (Check), (Act) cycle can be applied, which as a loop allows the continuous improvement of the system investigated during the whole life cycle of the establishment. [12]

It is expedient to place particular emphasis on phase 4 of the PDCA cycle (act) that is on the integration of the modifications identified as a result of the reviews, internal audits and on their application in the operating practice for the sake of the continuous improvement of the safety management system. The experiences of international authorities show that the actions determined as a result of management audits, internal audits are not in every case implemented and integrated into the safety management system of the establishment. The goal of the amendment of the Directive is to promote these activities.

As the result of the review of the safety performance the operator shall draw the most important conclusions, determine the required changes and improvements of the safety management system. For the recap of all of these points it is expedient to prepare a safety action program that includes the name of the responsible organizational units/people assigned to the individual tasks, the implementation deadline and the available resources as well.

In the light of the results of the review the safety policy can be modified, re-designed, the priority of subjective/human/financial resources can be changed, in this way the continuity of the cycle aimed at the continuous improvement of safety can be ensured.

In case the desired safety improvements are, due to financial/economic or other reasons out of the normal SMS development cycle (1, up to 2 years), e.g. can be realized within the next 5 years, then for the more efficient resource allocation and for the better progress tracking it is recommended to include these actions in a medium-term safety development program.

In the course of the determination of safety performance assessment procedures and indicators the establishment of an objective, transparent, traceable performance measurement system with follow-up option shall be endeavored.

The safety performance indicators shall be determined in conjunction with the safety objectives set before, in order to express such safety objectives in figures (target value determination) and in order to follow-up the achievement of such objectives. The application of the system of performance indicators allows the company to verify whether the individual fields of safety management get an appropriate focus and provides insight for the efficient future allocation of resources.

Through the elaboration of the system of safety performance indicators the company is able to:

- assess the compliance of the implemented safety policy, objectives and procedures,
- evaluate the efficiency of the efforts aimed at the improvement of safety,
- set out the directions for the change of procedures and policies.

The OECD guide [13] dedicated to this topic defines the establishment of the system of safety performance indicators in seven steps.

1. The creation of a team in charge of the establishment of the system of performance indicators
   The first step of the establishment of the program is to create the right team that will place a key role later on in the further improvement of the program. Technical experts and employees with practical operating experience are indispensable members of the right team.
   After the creation of the team it is expedient to prepare an action plan (including the scheduling and the milestones, and the designation of resources) in order to ensure the right progress of the process.
2. Identification of key issues
   It is necessary for every company to decide about its own priorities, to select the appropriate indicators and to determine the method of their measurement.
   It is reasonable to launch the program with a limited number of indicators and to increase their number after getting operating experience. In this step it is reasonable to focus on what instead of how the company wants to measure. It is not important what the company measures and what the company can measure at the present, but important is what is necessary to measure in order to assess the efficiency of the SMS and the related implementation of the same.
3. Determination of the achievement indicators and their units
   By using achievement indicators, it is possible to measure the safety policies, procedures and practices examined, in terms of whether they reach their desired goal and produce the expected results. They convey clear information about the safety performance to decision makers and authorities alike. The goal of using indicators is among others to identify potential improvements in the field of safety from major accidents involving hazardous substances. The resulting temporary reduction that can be demonstrated in the safety performance of the establishment by using the indicators is basically no problem, on the contrary, it proves also the efficiency of the indicators established. Of course the appearance of negative tendencies also requires examination and actions in order to permanently improve the management system.
4. Determination of the activity indicators and their units
   While achievement indicators answer the question whether the company has

reached the desired safety results, activity indicators supply information about "why" something happened. For this reason carefully designed activity indicators shall provide the right information for the development of corrective activities, procedures, in case the company did not manage to reach the desired safety results.

5. Data collection and generating the report
   As first step it is justified to determine the subject (what kind of data) and the method of data collection. It is expedient to review the available data sources (e.g. the data collected in the field of quality management or because of other business objectives) and to decide if they are suitable for being used in the present program.
   The data collection procedure shall cover also the frequency of data collection and of the preparation of the assessment report. It is reasonable to select a frequency making it possible to identify the changes occurring in the processes in order to be able to take the necessary actions in due time.
6. Acting in the light of the indicators
   The results of the assessment of the safety performance indicators, including the exceeding of the tolerance limits, the long-term continuity of disturbing tendencies and inconsequent events (if any) require subsequent actions. The reports prepared at pre-defined intervals including the most important pieces of information shall be conveyed to the top management, to the safety organization, to engineers and other employees concerned.
7. Assessment and refining performance indicators
   It is necessary to periodically assess and review the program (including the indicators and their measure). In the course of the review the indicator definitions can be clarified, new fields can be added to the program and individual safety issues can be answered.

For the continuous improvement of the safety management system it is indispensable to examine unexpected events that hint at the disturbances of the safety management system, the evaluation of experiences, drawing conclusions and in the light of all these points wording improvement proposals and the integration of such proposals into everyday operating processes. The legal regulations related to the prevention of major accidents define tasks both for the operator, both for the authorities in connection with the investigation of incidents, major accidents involving hazardous substances. There is no significant change in the content of the relevant regulations, but the legislator has emphasized the importance of the field by re-wording the existing regulations.

With regard to the field the application of the so-called "Accimap" approach can be proposed. The method helps analyzers by visualizing factors triggering the unexpected

event on only one logically structured diagram understand the circumstance of the occurrence and allows the identification of fields that are critical for the safety of the system investigated and offers a great starting base for the definition of procedures aimed at the elimination of deficiencies found. [14] The approach was successfully applied by internationally recognized experts in the field of the prevention of major accidents involving hazardous substances. [15]

In Hungary, in the period 2012–2014 39% of the incidents involving hazardous substances could be traced back to equipment failures, 18% to human negligence, 6% to the erroneous function of safety equipment. [16] In this field, by means of a management system established properly, operated efficiently and effectively the number of unexpected events can be effectively reduced.

A major part (39%) of the incidents involving hazardous substances reported during the period examined can be attributed to failures (construction, mechanical or material defects). These include also the failures resulting from the normal, operation-related wear and damages of flange gaskets and other gaskets in the various technological equipment, the failure of shut-off valves, compressors, pumps and reactors.

The ratio of incidents attributable to operating errors was significant (18%). This type of errors can in most cases be traced back to human negligence or to the defects of the safety management/control system. A typical cause for errors is the intentional or accidental opening of pressurized or uncleaned equipment containing hazardous substances in the course of the maintenance works of hazardous technologies and the result release of materials and the inaccurate execution or complete omission (i.e. no inserting after autoclave cleaning) of certain phases of the maintenance works (i.e. the inappropriate closing of the vent valves). A further cause for the occurrence of errors is the start of unexpected chemical reactions that can be traced back to the breach of the regulations regarding the isolation of hazardous substances (including wastes), leakages caused by operator's errors (e.g. the overheating or overfilling of tanks) and traffic accident within the battery limits involving the release of hazardous substances.

18% of the events that occurred can be traced back to external disturbances or to the activity of third parties. This category includes first of all forced shutdowns resulting from the loss of the power supply and from the failure of other public utility line connected to the establishment (e.g. due to the cutting of the natural gas pipeline by excavator) and in case of the facilities used for the pipeline transportation of hazardous substances from the tampering of the equipment related to the illegal consumption of the product transported.

12% of the events occurred due to other or to unknown reasons. A part of the events occurring due to unknown reasons is being investigated by the operator.

The ratio of events resulting from the erroneous function of safety equipment usually leading to the shutdown of plants is significant (6%). This group of errors includes incidents due to the material released by safety valves in spite of normal operation, emergency

shutdowns due to the erroneous signaling by various detection and measuring instruments (e.g. thermocouples, gas detectors) and due to the erroneous function of the software-based safety control system and of the related safety interlock system.

The ratio of incidents involving hazardous substances resulting from the corrosion leaks usually found on pipelines is 4% of all incidents.

The ratio of incidents that can be traced back to earth movements or other natural dangers is low, 3% only. This category includes first of all fire related to hazardous substances and caused by lightning and fire caused by electrostatic charge resulting from unfavorable weather conditions.

Emergency Planning

In the Directive, Annex III, section b) sub-section vi. the following highlighted changes have been made: "planning for emergencies – adoption and implementation of procedures to identify foreseeable emergencies by systematic analysis, to prepare, test and review emergency plans to respond to such emergencies and to provide specific training for the staff concerned. Such training shall be given to all personnel working in the establishment, including relevant subcontracted personnel."

With regard to this substantive element the requirements of the legal regulation remain unchanged.

The operator shall create and continuously ensure the conditions needed for the prevention of major accidents involving hazardous substances and for the mitigation of their consequences. [17] The operator shall provide the right assets to the executing organizations involved in the emergency response. In the frame of this the following shall be ensured:

- the existence, availability of protective equipment, technical safety equipment that can be used for the prevention and their periodical maintenance (maintenance schedule) the following in particular: monitoring systems (e.g. fire alarm system, gas detector), protection equipment (e.g. extinguishers, emergency ventilation system), information systems (e.g. sirens, public address systems), emergency communication systems (e.g. walkie-talkies, internal phone network) individual protective equipment (e.g. breathers, clothes protecting from chemicals), special technical assets (e.g. mobile gas detectors, absorbing materials, vessels, first aid kit),
- the preparation of the relevant training documents (curriculum topics, curriculum),
- the preparation of the documents of the internal emergency plan/major emergency management plan and the evaluation of experiences.

It is important that with regard to the substantive elements of the emergency planning procedures based on the results of risk assessment are developed in order to efficiently mitigate the consequences of the major emergency scenarios assumed within the battery limit. There must be procedures in place to appoint employees within the emergency organization (including the selection and aptitude test, preparation, the communication of the decision made about the appointment, the periodical aptitude test) to provide the individual protective equipment and special technical assets (including the determination of the type of the asset, the training about the use of the asset and the handover and acceptance). [18] The normal and emergency communication procedures between the members of the organization shall also be in place (including procedures regarding the organization of trainings, drills and the alarming of employees with special competences outside of the working hours, and the communication at the location of the emergency). The operator shall pay particular attention to the design and operation, to the temporary decommissioning, change of the infrastructure (chemical and weather monitoring system, fire alarm and firefighting infrastructure, plant laboratory) the emergency planning is based upon.

Summary

The safety management system operated effectively and efficiently is one of the most important tools in the prevention of major accidents involving hazardous substances. With the introduction of the SEVESO III. Directive the legal regulations regarding safety management systems have been renewed. After the review of the most important new requirements published with regard to the individual substantive elements the implementation possibilities that are instrumental for the efficient and effective establishment and operation of safety management systems are defined and presented by using practical examples. The recommendations worded and summed up based on the experiences of operators, domestic and international authorities are a real help for chemical companies in the course of their activities aimed at the improvement of safety.

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A Seveso III. irányelv biztonsági irányítási rendszerrel kapcsolatos szabályozásának végrehajtási lehetőségei

Zoltán Mesics

A súlyos balesetek megelőzésének egyik fő eleme a biztonsági irányítási rendszer üzemeltetése. A Seveso III. Irányelv módosította a biztonsági irányítási rendszerrel kapcsolatos jogi szabályozást. A jogi szabályozás módosult rendelkezéseinek elemzését követően a szerző a nemzetközi és a hazai hatósági jogalkalmazási tapasztalatokra támaszkodva biztosít megoldási lehetőségeket.

Kulcsszavak: Seveso III. Irányelv, biztonsági irányítási rendszer, veszélyes anyagokkal kapcsolatos súlyos balesetek, veszélyes üzem