



ISPRA

Istituto Superiore per la Protezione
e la Ricerca Ambientale

**SURVEY ON FINDINGS OF INSPECTIONS CARRIED
OUT IN UPPER TIER MAJOR HAZARD
ESTABLISHMENTS MANAGED BY MULTINATIONAL
COMPANIES**

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AIM:

Analyze and present the findings about the non-compliance

Highlight the SMS elements which implementation in multinational companies establishments resulted particularly positive

Through the examination of a sample of 55 inspections/reports

THE TOOL

The national Competent Authority, the Ministry of the Environment (MATTM), charged ISPRA, its technical body, for developing and updating the national database on the outcomes of the evaluation of Safety Management Systems

Through this database, it was possible to extrapolate the findings contained in a sample of 55 reports of the inspections carried out in the establishments located in Italy and belonging to multinational companies

The database, provides information, among others, related to:

- The analysis of operational experience pointing out SMSs faults;
- The evaluation of the Document on Major Accidents Prevention Policy (MAPP) and of the effective implementation of the Safety Management System by the operator;
- Evidences, findings and minor or major noncompliance, resulting from the inspections, carried out by a detailed examination of the checklist set up by the MATTM and ISPRA.



The checklist used for the SMS inspections, (8 elements and 27 specific points)

1 Document on major hazards prevention policy, SMS structure and its integration with the general management of establishments

- i Definition of Prevention Policy
- ii Structure of the SGS adopted and integration with enterprise management
- iii Contents of the Policy Document

2 Organization and personnel

- i Definition of responsibilities, resources and activity planning
- ii Information activities
- iii Training activities
- iv Human factors, operator-plant interfaces

3 Evaluation and identification of major hazards

- i Identification of hazardous substances, definition of criteria and security requirements
- ii Identification of possible accidents and safety analysis
- iii Planning plant and management improvement for the reduction of risks and update

4 Operational control

- i Identification of installations and equipment subject to checking plans
- ii Documents management
- iii Operating procedures and instructions in normal, hazardous and emergency conditions
- iv Maintenance procedures
- v Procurement of materials and services



5 Management of change

- i Technical, procedural and organizational changes
- ii Documents Update

6 Emergency planning

- i Consequence analysis, planning and documentation
- ii Roles and Responsibilities
- iii Checks and monitoring for the management of emergency situations
- iv Alarm systems, communication and support to external response
- v Assessment on systems related to the management of emergency
- vi Control room and/or emergency management center

7 Monitoring performances

- i Performance evaluation
- ii Analysis of accidents and near-misses

8 Audit and review

- i Audits
- ii Review of the prevention policy of SMS

The relevance of the Document and the SMS

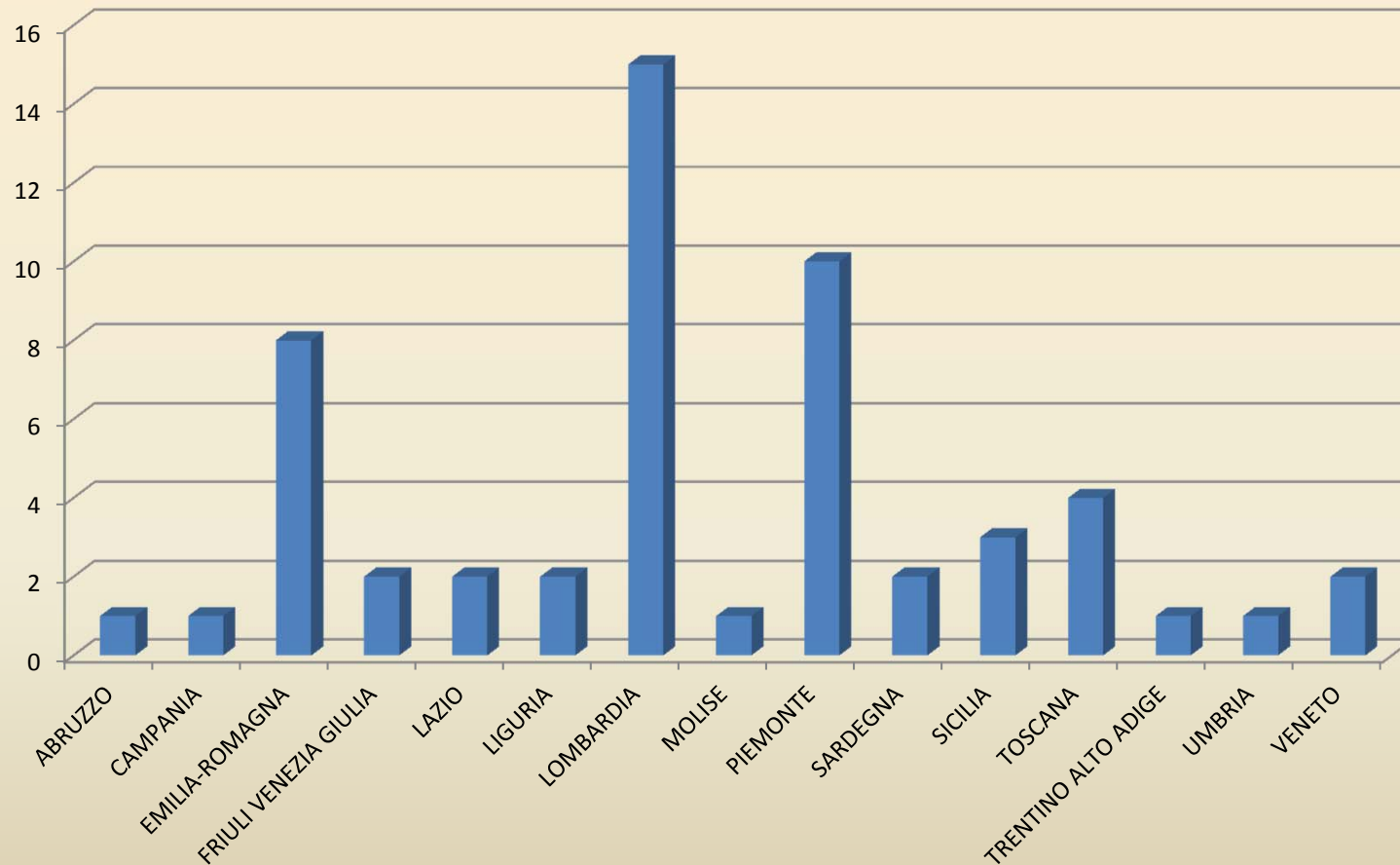
The Document on MAPP is the tool for the operator to organize and communicate its safety management

Required contents of the Document on major accident prevention policy

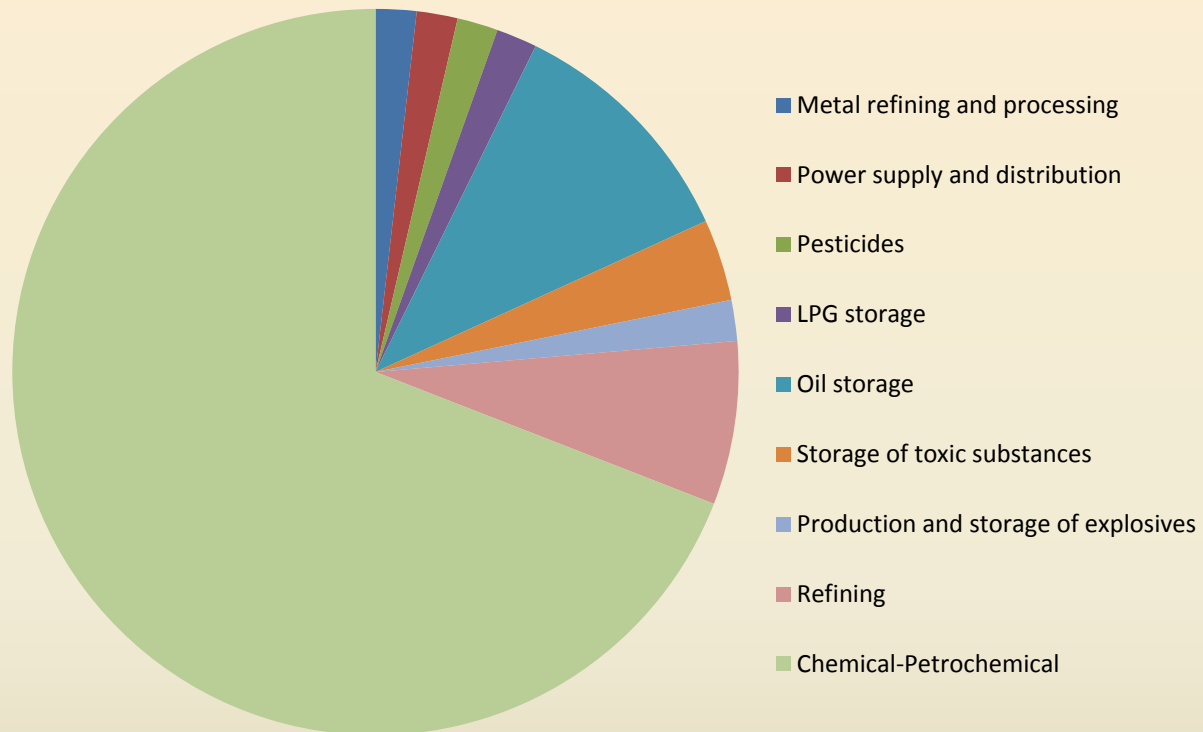
- objectives
- general principles of the policy established
- information on compliance with other voluntary management systems (i.e. EMAS, ISO, Responsible Care, OHSAS, etc.)
- how the SMS applies principles and objectives (actions)
- SMS structure (main issues)
- SMS implementation or planning of improvement actions

FINDINGS FROM THE ANALYSIS OF THE INSPECTION REPORTS

n. of establishments by Region



Industry Sectors



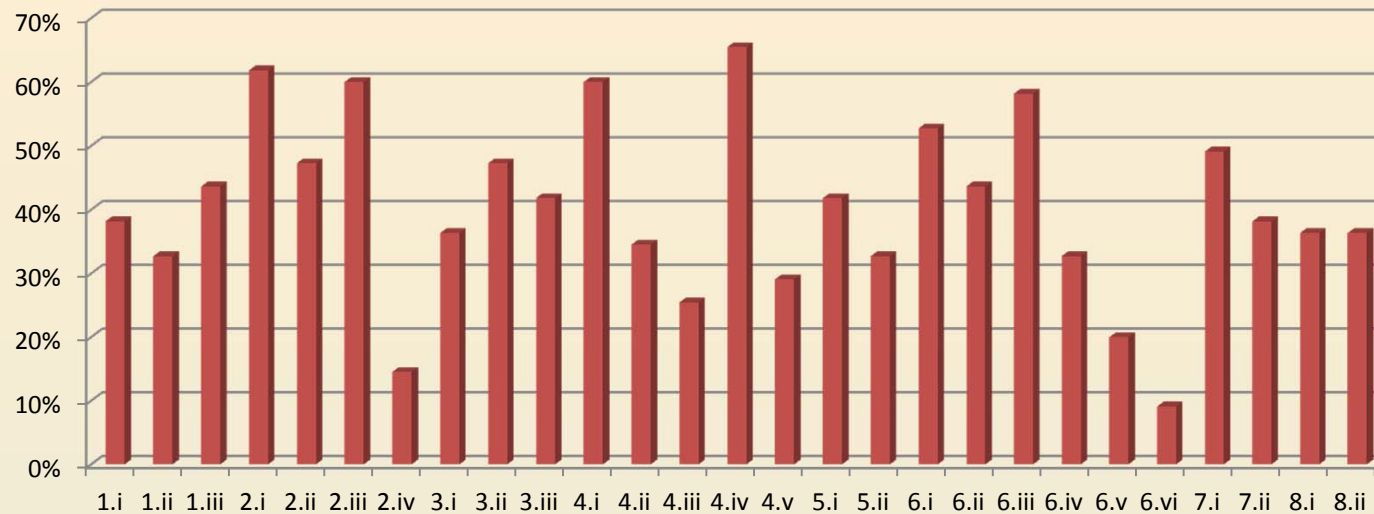
Overview of the most common management failures found during the inspections

Any non-compliance, depending on the level of severity, detected by inspection commissions is classified in minor or major

• **Major non-compliance:** evidence of substantial not-compliance with legal requirements, technical standards taken as reference for the SMS or corporate standards (missed or incomplete compliance with the rules concerning the information and training of personnel and the implementation of SMS, lack of involvement of the representatives of workers in the definition of the Document MAPP, missed consultation of the personnel working in the establishment, including long term contractors, during the set up of the Internal Emergency Plan, etc.). A minor non-compliance not corrected (for example, a recommendation identified during the last inspection and not taken into consideration by the operator), may also become a major non-compliance during the subsequent inspection

• **Minor non-compliance:** evidence of formal aspects not adequately fulfilled (for example, the requirement for a standard adopted voluntarily not completely satisfied, due to lack of adequate supporting documentation, an element of the SMS adopted by the operator but without adequate documentation to support it, etc.).

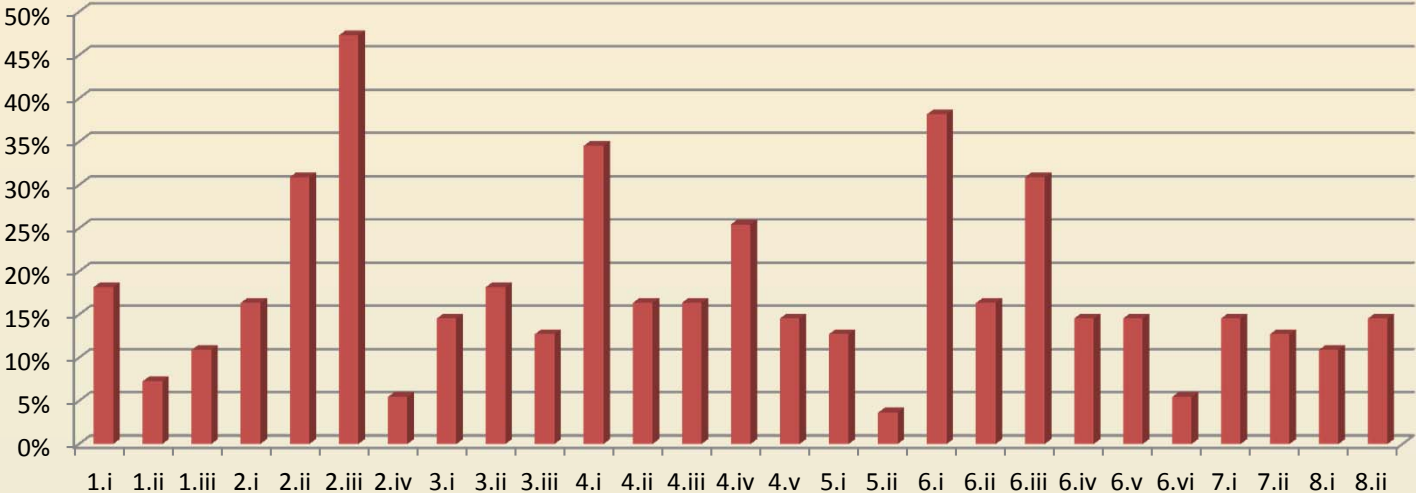
Minor non-compliance



This means, in practical terms, that they have been detected possible areas for improvement such as:

- in 33 cases as regards to the information and training of personnel;
- in 36 cases as regards to maintenance;
- in 32 cases for the activities of emergency management and related controls and checks.

Major non-compliance



The detailed analysis of the final reports

Weaknesses and the strengths most recurrent in terms of content, beyond the statistical analysis

The elements of the SMS analyzed:

- Document on MAPP, structure of the SMS and its integration with the enterprise management
- Organization, roles and responsibilities
- Information and training
- Evaluation and identification of major hazards
- Operational control and maintenance
- Management of Change
- Internal Emergency Plan, organization, drills
- Performance Indicators
- Internal audits

It's necessary to specify that

Were not always identified aspects completely positive or completely negative in this kind of companies, considering the complexity of the requirements for the implementation of a SMS: in most cases there was an overlap of them, limited to specific requirements

Document on major hazards prevention policy, structure of the SMS and its integration with the enterprise management

Strengths

- Most of the organizations have adopted an integrated SMS, generally with environment and safety at work management systems, supported by the adaptation of the system required by the corporate to the national law and requirements.
- Sharing of the “Document” on MAPP with all personnel, through information campaigns, following its setting up with the consultation of workers' representatives (a law requirement in Italy).

Weaknesses

- Shortages in both formal and practical aspects, with regard to the involvement and consultation of workers' representative and the preparation of adequately detailed SMS improvement plans.
- Less frequently, as far as concerns the contents of the “Document” on MAPP, characterized by a structure common to all establishments of the Corporate, without any specifications for each site.
- In some rare cases inspectors found that the site operator preferred to comply with the Corporate SMS, rather than the requirements due under local law.

Organization, roles and responsibilities

Strengths-Weaknesses

Balance between the organizations:

- That have successfully established a hierarchical structure to address the prevention of major accidents, well defining roles, tasks and responsibilities and including the provision of regular meetings for the communication on safety matters to the whole personnel
- Without an effective and well defined internal structure for safety or adequate human resources dedicated.

Information and training

Reference: specific Decree which defines the minimum requirements for information activities and training for workers in a "Seveso" establishment

Strengths

- For many organizations: a considerable effort in the attempt to comply with the severe requirements of the Decree, through a schedule of training activities, the preparation of detailed programme focused on major accident hazards and, sometimes, with the direct involvement of the external personnel working in the site (contractors).

Weaknesses

- Some other aspects of "training" of personnel must be improved in many ways, from the full compliance with the planned activities for internal workers, contractors and visitors, the evaluation of the results achieved, including a more extensive use of learning tests (points 2.II and 2.III).

Evaluation and identification of major hazards

Strengths

- Developing of specific procedures for the hazards evaluation, compliant with the national legislation and consistent with the typology of industrial processes, in order to prepare Safety Report, to be submitted to the evaluation of the competent authority.

Weaknesses

- Safety data sheets management,
- Safety requirements definition for the equipment and for the plant design activities (national standards, corporate standards, etc.).

The risk assessment procedure not always takes into account the results of operating experience, the levels of analysis required, the techniques of analysis and the identification of applicable legislation

- Risk reduction activities that must be planned considering all possible input elements, such as, for example, the site, the corporate and of other similar plants operational experience and the results of the performance indicators analysis.

Operational control and maintenance

Strengths

- Comparing to the first period of implementation of the Seveso Directive:
- Greater attention to the identification of the critical equipment and systems for the prevention and mitigation of major accidents

Not only using the information provided by the manufacturers, but also on the basis of the safety analysis carried out to prepare the safety report

- Particular attention to the setting up of effective operational procedures and the enforcement of a system of permits to work.

Weaknesses

- Not all the organizations still consider the correct identification of the elements and critical equipment, supported by procedures that define the criteria for their classification and based on the results of risk analysis, a sound basis for their maintenance activities.
- The need of a full compliance of the planned frequency for equipment inspection and maintenance.
- Permit to work: in some cases it was necessary to recommend the improvement of its structure, in terms of the flow of authorizations and the specific definition of its scope and use (point 4.iv).

Management of change

Strengths

- Correct approach of the organization to the management of change, the classification of the typologies of changes (technical, organizational, temporary), the evaluation of the impacts that they may have on the SMS and the planning of an adequate training for personnel before the change is implemented.

Weaknesses

- In some cases the consideration of temporary changes or organizational changes was neglected or missing. A minor number of inspected organizations do not have clear criteria for the classification of changes yet.

Internal Emergency Plan, organization, drills

Strengths

- Set up of an IEP consistent with the accident scenarios in the safety report, the allocation of roles and responsibilities for the emergency team members and, in most cases, the planning of emergency drills.

Weaknesses

From a formal point of view:

- Inconsistencies between emergency levels in the IEP and the External Emergency Plan
- The involvement of workers' representatives, both internal and contractors, despite the requirements of the European and Italian law(point 6.i).

Emergency drills:

- Behaviors of the operators not corresponding to what is set in the procedures, i.e. in terms of use of specific PPE required by emergency situations
- In the recording of the outcomings of the drill, and in the analysis and developing of appropriate corrective actions (point 6.iii).

2.4.7 Performance Indicators

Strengths-Weaknesses

- Substantial balance between strengths and weaknesses, as far as concerns setting up and use of appropriate and effective performance indicators. In particular, while emerged a significant use of performance indicators (generally able to ensure effective measurability of the various SMS elements and with a constant monitoring of their significance), from the other side indicators not tailored on the establishment, difficult to measure and unrepresentative were in some cases used, combined with a poor consideration of the results of the analysis of operational experience.

2.4.8 Internal Audits

Strengths

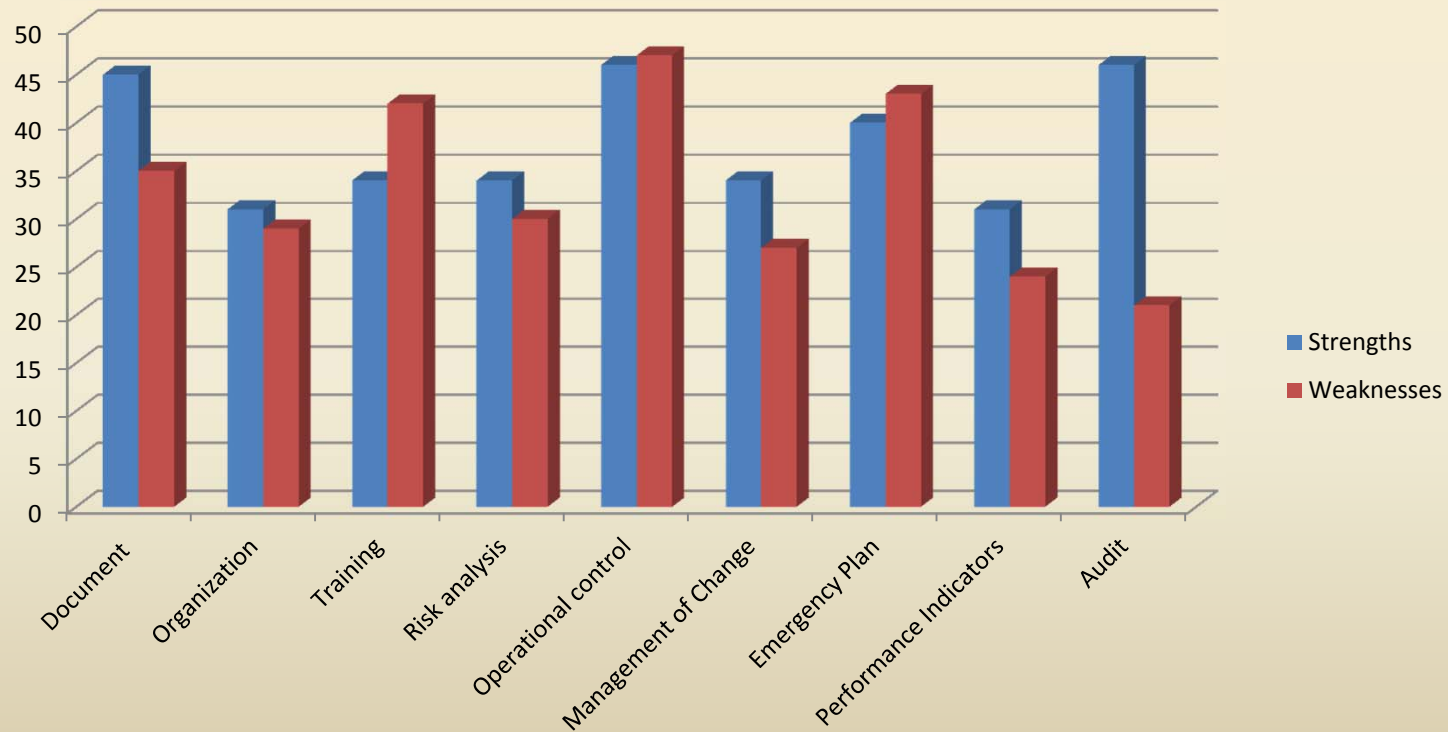
- Constant planning and carrying out of periodic safety audits aimed to test the effectiveness of SMS, always supported by procedures that define the criteria and the ways to conduct them, the organizational positions involved, the documentation to use.

Weaknesses

- Need to improve, even in the presence of appropriate audit procedures and constant activities, the recording and analysis of the results obtained and the subsequent setting up of corrective actions.

3.0 CONCLUSIONS

- The analysis showed that there is no a real dividing line between a perfectly implemented SMS and another one absolutely deficient: rather, there are different levels of implementation, with more or less SMS faults and therefore with different opportunities for improvement



Relevant and essential elements of the SMS implemented in a surely positive way:

- The use of integrated management systems, supported by a business organization oriented to deal with balance requests from the Corporate, even outside of the European context and the provisions of the national legislation and regulations issued by the competent authorities;
- Sharing with all levels of personnel procedures that substantiate the SMS, and bi-directional communication with the units involved in the prevention of major accidents;
- A commitment to organize training activities in accordance with the requirements of national legislation;
- Attempting to arrange maintenance activities based on the identification of critical equipment for the prevention and mitigation of major accidents and the awareness of the importance of setting up a system of permits to work;
- Proper management of all changes (technical, organisational, temporary);
- The preparation of an IEP consistent with the top events evaluated in the safety report, supported by regular emergency drills;
- The importance of a system of performance indicators able to provide significant and measurable elements for evaluating the effectiveness of the SMS and the planning and carrying out of periodic audits.

Proposed actions for a further improvement of SMS

Information, and training of personnel: procedures carefully developed, able to clearly specify all the steps expected to conduct such activities, in order to ensure:

- Annual planning of activities with specific topics related to the prevention of major accidents, in accordance with the national regulation in terms of periodicity and employee involvement (from new recruits to contractors);
- Availability of reports and certificates of successful information and training and any assessment of the activities done;
- Documentation demonstrating that a regular activity of learning test is carried out
- Documentation demonstrating the consultation of the workers' representatives;
- the presence of documentation demonstrating the supporting evidence for the activities carried out by the company in respect of contractors, and what was done by the latter towards their employees



Operational control: although the activities relating to the maintenance of equipment and systems plays a key role in the management of safety

They are sometimes based on maintenance programs not defined on analytical basis, but rather resulting from established practices, sometimes neglecting key elements for the prevention of major accidents.

It is important to remember:

- That the scheduling must be set up at least on the basis of information provided by suppliers in the manuals of operation and maintenance,
- That in the testing and maintenance programme, the equipment for the prevention and mitigation of major accidents must be always identified as "critical";
- That in the definition of the critical components must be taken into account the results of the risk assessment, ensuring that the components and/or systems that have been provided to prevent and/or mitigate major accidents are at least considered as "critical" and therefore included in a specific programme of testing and maintenance.

Emergency planning: it is necessary to implement improvement actions to ensure:

- A better coherence of the internal emergency plan (IEP) with the external emergency plan (EEP) and with the results of the risk analysis
- Any review of the IEP as a result of the update of the EEP should therefore be documented and justified
- That the consultation of personnel working inside the establishment, including long-term relevant subcontracted personnel, is documented
- The emergency drills should also involve external authorities; in particular, it should be highlighted the requirements of training for all the people involved in the emergency (emergency team, employees, contractors)
- Every step of the emergency drills should be carefully prepared from their planning to the critical analysis of the results and documented, in order to set up, if necessary, the appropriate corrective actions.

Evaluation of performance and analysis of operating experience: it is important to understand that is essential for the correct implementation of a SMS:

- The identification of realistic and measurable safety performance indicators (SPI), consistent with the commitments of the prevention policy, their constant evaluation and updating
- Defining the most appropriate and representative SPI in order to ensure the direct comparison between the objectives to be achieved and the results obtained.
- A thorough analysis of accidents occurred in the company or in similar plants
- A strong commitment of the operator to demonstrate that there is a procedure for the classification, reporting, recording and analysis of accidents, based on:
 - well defined assignment of responsibilities and the level of involvement of various units;
 - well defined information to be collected and their type, methods of analysis, format of the report and records for the collection of information;
 - clear identification of the subjects to be involved in the discussion and an in-depth analysis of the events.

Thank you for your attention
GRAZIE PER L'ATTENZIONE