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OECD SERIES ON CHEMICAL ACCIDENTS
Number 9

Report of the OECD Workshop on Integrated Management of Safety, Health, Environment and Quality Seoul, Korea, 26 - 29 June 2001

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OECD Environment, Health and Safety Publications

Series on Chemical Accidents

No. 9

Report of the OECD Workshop on Integrated Management of Safety, Health, Environment and Quality

Seoul, Korea, 26 - 29 June 2001

IOMC

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS

A cooperative agreement among

UNEP, ILO, FAO, WHO, UNIDO, UNITAR and OECD

Environment Directorate
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT
Paris, 2002

REPORT of the WORKSHOP on INTEGRATED MANAGEMENT of SAFETY, HEALTH, ENVIRONMENT and QUALITY

(Seoul, Korea, 26-29 June 2001)

Some other OECD publications related to Chemical Accident Prevention, Preparedness and Response:

Guiding Principles for Chemical Accident Prevention, Preparedness and Response: *Guidance for Public Authorities, Industry, Labour and Others for the Establishment of Programmes and Policies related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances* (1992) [Under Revision]

International Directory of Emergency Response Centres (first edition, 1992) [prepared as a joint publication with UNEP-IE; under revision]

Report of the OECD Workshop on Strategies for Transporting Dangerous Goods by Road: Safety and Environmental Protection (1993)

Health Aspects of Chemical Accidents: *Guidance on Chemical Accident Awareness, Preparedness and Response for Health Professionals and Emergency Responders* (1994) [prepared as a joint publication with IPCS, UNEP-IE and WHO-ECEH]

Guidance Concerning Health Aspects of Chemical Accidents. *For Use in the Establishment of Programmes and Policies Related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances* (1996)

Report of the OECD Workshop on Small and Medium-sized Enterprises in Relation to Chemical Accident Prevention, Preparedness and Response (1995)

Guidance Concerning Chemical Safety in Port Areas. *Guidance for the Establishment of Programmes and Policies Related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances. Prepared as a Joint Effort of the OECD and the International Maritime Organisation (IMO)* (1996)

New OECD Series on Chemical Accidents:

No. 1, Report of the OECD Workshop on Risk Assessment and Risk Communication in the Context of Chemical Accident Prevention, Preparedness and Response (1997)

No. 2, Report of the OECD Workshop on Pipelines (Prevention of, Preparation for, and Response to Releases of Hazardous Substances (1997)

No. 3, International Assistance Activities Related to Chemical Accident Prevention, Preparedness and Response: Follow-up to the Joint OECD and UN/ECE Workshop to Promote Assistance for the Implementation of Chemical Accident Programmes (1997)

No. 4, Report of the OECD Workshop on Human Performance in Chemical Process Safety: Operating Safety in the Context of Chemical Accident Prevention, Preparedness and Response (1999)

No. 5, Report of the OECD Workshop on New Developments in Chemical Emergency Preparedness and Response, Lappeenranta, Finland, November 1998 (2001)

No. 6, Report of the OECD Expert Meeting on Acute Exposure Guideline Levels (AEGLs) (2001)

No. 7, Report of the Special Session on Environmental Consequences of Chemical Accidents (2002)

No. 8, Report of the OECD Workshop on Audits and Inspections Related to Chemical Accident, Prevention, Preparedness and Response (2002)

Internet Publication, Report of CCPS/OECD Conference and Workshop on Chemical Accidents Investigations (2002)

Special Publication, International Directory of Emergency Response Centres for Chemical Accidents (2002)

About the OECD

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation in which representatives of 30 industrialised countries in North America, Europe and the Pacific, as well as the European Commission, meet to co-ordinate and harmonise policies, discuss issues of mutual concern, and work together to respond to international problems. Most of the OECD's work is carried out by more than 200 specialised Committees and subsidiary groups made up of Member country delegates. Observers from several countries with special status at the OECD, and from interested international organisations, attend many of the OECD's Workshops and other meetings. Committees and subsidiary groups are served by the OECD Secretariat, located in Paris, France, which is organised into Directorates and Divisions.

The work of the OECD related to chemical accident prevention, preparedness and response is carried out by the Working Group (formerly Expert Group) on Chemical Accidents, with Secretariat support from the Environment, Health and Safety Division of the Environment Directorate. The objectives of the Chemical Accidents Programme include exchange of information and experience, analysis of specific issues of mutual concern in Member countries, and development of guidance materials related to chemical accident prevention, preparedness and response. As a contribution to meeting these objectives, over a dozen Workshops have been held since 1989.

As part of its work on chemical accidents, the OECD has issued several Council Decisions and Recommendations (the former legally binding on Member countries), as well as numerous Guidance Documents and technical reports (see partial list on page 5 and 6). Publications include the OECD's *Guiding Principles for Chemical Accident Prevention, Preparedness and Response*; *Guidance Concerning Chemical Safety in Port Areas* (a joint effort with the IMO); *Guidance Concerning Health Aspects of Chemical Accidents*; the joint IPCS/OECD/UNEP/WHO publication, *Health Aspects of Chemical Accidents*; and the joint OECD/UNEP *International Directory of Emergency Response Centres* (currently being revised by the OECD, UNEP-TIE and the Joint UNEP/OCHA Environment Unit).

The Environment, Health and Safety Division produces publications in seven series: **Testing and Assessment**; **Good Laboratory Practice and Compliance Monitoring**; **Emission Scenario Documents, Pesticides**; **Risk Management**; **Harmonisation of Regulatory Oversight in Biotechnology**; and **Chemical Accidents.** More information about the Environment, Health and Safety Programme and EHS publications is available on the OECD's web page.

This publication was produced within the framework of the Inter-Organisation Programme for the Sound Management of Chemicals (IOMC).

The Inter-Organisation Programme for the Sound Management of Chemicals (IOMC) was established in 1995 by UNEP, ILO, FAO, WHO, UNIDO and the OECD (the Participating Organisations), following recommendations made by the 1992 UN Conference on Environment and Development to strengthen co-operation and increase international co-ordination in the field of chemical safety. UNITAR joined the IOMC in 1997 to become the seventh Participating Organisation. The purpose of the IOMC is to promote co-ordination of the policies and activities pursued by the Participating Organisations, jointly or separately, to achieve the sound management of chemicals in relation to human health and the environment.

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FOREWORD

This report presents the main output of the OECD Workshop on *Integrated Management of Safety, Health, Environment and Quality*, which took place in Seoul, Korea, on 26–29 June 2001. The Workshop was hosted by the Korea Occupational Safety and Health Agency (KOSHA) and sponsored by the Korean Ministry of Labour.

Approximately 90 experts attended the workshop, representing seven Member countries, one non-Member country, the European Commission, the International Labour Office (ILO), industrial organisation, academia and other stakeholders (see list of Participants in Annex 2).

The general objective of the Workshop was to investigate how to establish/improve integrated management of Safety, Health, Environment (SHE) and Quality (Q) programmes within companies and within public authorities. The following issues were addressed:

- Examples of integrated SHE and SHE&Q approaches within companies and within public authorities at different levels;
- Relations/needs of integrated SHE&Q systems *versus* existing standards (e.g. ISO 9000, ISO 14000);
- The governmental regulations related to integrated SHE&Q;
- The range of tools available for integrating safety, health and environment management, for example using a Quality Management programme;
- The roles and responsibilities of the different parties (industry, labour, public authorities, certification/accreditation services, international organisations, etc.) with respect to facilitating, promoting, implementing and controlling SHE&Q systems;
- The possible areas for further international co-operation in this filed (e.g. the development of government strategies to promote the integration of SHE&Q)

The first part of the report consists of the Workshop conclusions and Recommendations. This is followed by the Discussion document (see Annex 1) prepared for the Workshop. An earlier version of the Discussion Document was presented at the Workshop; it was revised in light of comments received during the Workshop.

The OECD' Working Group on Chemical Accident recommended that this report be forwarded to the Joint Meeting of the Chemicals Committee and Working Party on Chemicals, Pesticides and Biotechnology, for consideration as an OECD publication. The Joint Meeting agreed that it should be made available to the public. It is published under the authority of the Secretary General of the OECD.

OECD WORKSHOP ON INTEGRATED MANAGEMENT OF SAFETY, HEALTH, ENVIRONMENT and QUALITY

(Seoul, Korea, 26 – 29 June 2001)

CONCLUSIONS AND RECOMMENDATIONS

1. The OECD Workshop on Integrated Management of Safety, Health, Environment and Quality (SHE&Q) was held 26 – 29 June 2001, in Seoul. It was hosted by the Korea Occupational Safety and Health Agency (KOSHA) and sponsored by the Korean Ministry of Labour. It was attended by representatives of a wide range of interested parties including public authorities, industrial organisations (individual companies, trade associations, accreditation companies, and consulting firms), international organisations and academia. There was also a broad geographical representation from both OECD member and non-member countries.

2. A number of presentations were made on current experiences of integrated systems, followed by discussion periods among participants.

3. The purpose of these Conclusions and Recommendations is to highlight key points made during the Workshop where there appears to be consensus among participants. It focuses on those points that provide insights into "best practice" related to the integration of SHE&Q, and identifies areas where further activities may be warranted. It does not attempt to summarize the presentations and discussions.

I. Introduction

4. The Workshop provided an opportunity for participants to discuss issues and share experiences related to the development and use of management systems for the integrated management of safety, health, environment and quality programmes both within enterprises and in public authorities.[1] The Workshop did not address the specific standards to be achieved in the areas of SHE&Q. Rather, it focused on the development and application of tools (e.g., management systems) that allow enterprises and organisations to effectively address risks in an integrated way, leading to improvements in SHE and Q performance.[2]

5. For purposes of this document, the term "quality" is defined in a broad way to describe the total quality of management processes; it should not be considered in terms of the narrow definition of the quality of products and services. In this regard, it was agreed that "quality" encompasses quality of safety, health and the environmental management processes. This is consistent with the amendments to the

[1] In this Document, safety, health, environment and quality will be represented by their initials (i.e., S, H, E and Q).

[2] For purposes of the Workshop: "safety" involves both process safety and worker safety (protection from injuries or accidents); "health" incorporates both work related illnesses and the protection of employees and the public from exposures to hazardous substances; and "environment" includes both acute and long-term impacts outside of the boundaries of an installation, including the protection of property. "Environment" is broadly defined to include protection of various media (air, soil, groundwater, surface water, etc), as well as protection of flora and fauna.

ISO 9000 series standards, issued in 2000, which is now aimed at the quality of business practices. With this definition, quality is inseparable from good management systems for SHE. [3]

6. The Workshop discussions focused on the industries that produce, handle, transport or store hazardous substances, although the issues and principles discussed apply to other industries.

II. From Management Systems to Integrated Management Systems

7. The strategic goal of good SHE&Q management should be to integrate SHE&Q throughout the regular business operations of an enterprise leading to total quality management and, in general, to contribute to long-term sustainable development. In this regard, it was agreed that it is not possible to have sustainable development without a high standard of safety, health and environmental protection.

8. It was noted that approaches to managing health, safety and environmental issues have evolved considerably. There was general agreement that the application of management systems currently represent "best practice" in industry. In addition, for public authorities such systems provide the basis for controlling business processes, for assessing and verifying performance, for obtaining the necessary documentation, and for achieving continuous improvements.

- The Workshop recognised that management systems have a common approach known as the "Plan – Do – Check – Act (or correct)" cycle, with the goal of continuous improvement in performance.

- With respect to the management of any type of risk, essential elements of management systems include: identifying the hazards, assessing the risks (qualitative or quantitative), developing controls, implementing these controls, and monitoring and maintenance. These common steps can provide the starting point for achieving an integrated system.

- To be useful, management systems should be practical and easily implemented, without conflicting requirements.

9. The Workshop participants suggested that application of integrated management systems presents the logical next step in the evolutionary process towards the goal of total quality management. In this regard, it was noted that integration is a logical step because of the commonalities inherent in addressing safety, health, environmental and quality issues, and because of the benefits that can be gained from the synergies and the added simplicity of the integrated system. The guiding principle (goal) when establishing co-ordinated, or integrated, approaches should be improved performance in SHE& Q; the focus should not be on simply making administrative improvements.

10. There was a consensus that integrated management of safety, health, and environmental programmes have been widely accepted and applied, with clear benefit. There is now an effort towards the further integration of SHE with quality assurance programmes. In this regard, it was noted that in some cases, the process of integration utilised the quality assurance programme as the starting point; in other cases the integrated SHE management system was the starting point for the integration of SHE and Q. It was suggested that integration of SHE and Q should be followed as we begin the 21st century with a view towards achieving total quality management.

[3] The Discussion Document prepared for the Workshop, and included as part of the Workshop report, uses a more narrow definition of "quality", i.e., as it relates to the quality of products and/or services of the enterprise or the related idea encompassed in quality management systems such as ISO 9001/2.

III. Perspective of the Chemical Industry

11. There was a consensus among Workshop participants that the industry does and should have the lead role in managing the health, safety, environmental, and quality aspects of their operations. It should be the responsibility of industry to take the initiative to integrate its safety, health, environmental and quality assurance programmes even in the absence of governmental involvement or authority. It was also recognised that governments should, and do, play important roles in ensuring that the interests of all segments of society, including local communities, are taken into account (as further described below) and in ensuring protection of the environment.

12. It was agreed that integrated approaches generally result in enhanced SHE&Q performance. In addition, a number of other specific benefits/synergies of integration were identified, including:

- employee empowerment, combined with improved understanding by all employees of their roles and responsibilities and a related reduction in confusion caused by multiple procedures for a single operation;
- ease in integrating new staff into operations;
- simplicity, including a reduction in redundancies and number of administrative procedures (and therefore more effective use of available resources);
- prevention of losses and improved protection of the environment;
- reduction in incidents with common root cause(s);
- improved communication among departments;
- reduction in number of audits/inspections;
- improved communication with customers and communities, and support for meeting their concerns; and
- achievement of common goals.

13. There was also a consensus that an effective management system, integrating SHE& Q, is good business practice. It was noted that it is difficult to quantify all the benefits that derive from integrated management of SHE&Q. Nevertheless, it was explained that improvements in quality that result from integrated management (in terms of SHE performance) reduces the level of risk. This in turn prevents losses that could result in adverse effects to human health or the environment (from, e.g., accidents, injuries, emissions). Prevention of losses leads to increased productivity. Thus, integrated management should benefit the enterprise including its workers and shareholders. It should also benefit the general public, with improvements in safety, health and environmental protection.

14. It was also recognised that there could be disadvantages of integration including, for example: loss of focus or attention on one (or more) discipline in favour of another; leveling down to the level of the least developed discipline; and increased complexity of audits.

15. Several participants described how their organisations developed effective integrated management systems. A number of common steps could be identified, including:

- assessment of the situation/needs;
- development of a policy statement;
- design of a programme with active involvement of employees at all affected levels;
- implementation of the programme/management system;
- training and communication activities;
- supervision, monitoring and measuring;
- regular review and continuous improvement.

16. It was also noted that it is important that in designing an integrated system, the enterprise clearly identifies the boundaries of its activities.

17. There was a consensus that in order for efforts towards integration to be effective, there must be commitment and support from management at all levels, along with an allocation of the necessary resources. To the extent possible, enterprises should build on existing management systems in order to avoid confusion and to take advantage of the experience that already exists within the enterprise. It is also important to include high quality staff and representatives of all affected departments in the team responsible for developing an integrated system if it is to be effective in its implementation. Furthermore, an integrated management system should have mechanisms for ensuring accountability, and for applying sanctions when appropriate.

18. The Workshop identified several difficulties associated with attempts to develop and implement effective integrated management systems. For example, the Workshop cautioned that developing and implementing an integrated management system is a difficult and time-consuming process, and it is resource intensive, diverting staff from other responsibilities. Efforts must be taken to ensure the goal is kept in sight, i.e., that the integrated management system will lead to improved SHE&Q performance. Some enterprises get caught up in the development of the procedures and systems necessary for an integrated management system, with the risk of losing focus on the real goal.

19. The Workshop participants also noted that there is a risk that an integrated management system could be complex and difficult to administer. They noted that simplicity should be one objective in designing the system, in order that it will be more likely to be accepted and utilised.

20. In addition, there may be resistance to implementing an integrated management system from some members of management and staff, in particular if they perceive that it may lead to a loss of territory or authority within the organisation. There also may be significant difficulties in communication between different departments that have inherently different goals. Finally, legal/regulatory requirements may create hindrances to integration.

21. The participants also stressed the need to have a sense of ownership and participation by workers to the management system for it to function properly. Such ownership/participation comes from, *inter alia:* involvement in the process of development and implementation; seeing a strong commitment from management at all levels (including top management); and seeing the benefits of a simplified approach. In addition, the Workshop noted the benefits of a hiring process that provided the means for hiring staff who are committed to integrated approach to SHE. It is also important that the corporate culture supports worker commitment to the integrated system.

22. Education of all employees within an organisation is also critical, so that they understand the reason for moving to an integrated system and recognise the value of such systems. At the same time, it is important to consider how to communicate the changes in approach to managing SHE to outside stakeholders including public authorities and the local community.

23. There was general consensus that there is no one agreed methodology for integrating SHE&Q management systems. In this regard, Workshop participants described a number of different models. Several focused on approaches for applying existing international, regional and national standards (including, e.g., ISO 9000 and 14000 series, the ILO guidelines and OHSAS 18000) in an integrated fashion. The representatives of some enterprises and industrial organisations recognised the value of the Responsible Care initiative of the chemical industry as a basis for developing integrated management

systems. There were also some enterprises that described how they are developing their own tools for integration.

24. The Workshop noted that by integrating management systems, enterprises should not create a situation where inspections by public authorities are more complicated or difficult. This can be avoided by making transparent how the various elements have been integrated, and by keeping open good lines of communication. This is especially important during the transition period to an integrated approach.

25. The Workshop recognised that in order for SMEs to adopt a management system, it must be simple, affordable, effective and, as with all management systems, it must be measurable and reportable. The Workshop expressed concerns about the ability of small and medium-sized enterprises (SMEs) to adequately address SHE&Q risks, particularly in light of the large number of SMEs that present significant risks to safety, health and the environment. At some level (perhaps 30 or more employees), it becomes more important to put systematic management systems in place but there may be insufficient staff or other resources to undertake this task. The participants agreed that larger enterprises (including suppliers and enterprises within the same sector) have a responsibility to assist and help to educate the smaller enterprises and to provide a role model. Public authorities also have an important role in providing support to SMEs.

IV. Role of Public Authorities

Relationship to Industry

26. The Workshop participants discussed the changing role of public authorities in light of the increasing recognition of industry that it is in their self-interest to effectively manage safety, health, and environmental risks and in light of the constraints on the resources available to public authorities. The participants agreed that laws and regulations should primarily be performance-based, rather than "command and control." Furthermore, it was recognised that industry has the responsibility for maintaining safe operations and that laws should not hinder technological progress and other changes that occur in industry. Nor should the government determine whether, or how, industry should integrate their SHE and Q disciplines. Thus, the focus of public authorities, in their role of protecting human health and the environment, should be to establish minimum requirements and performance-based goals, leaving it to the industry to determine how to best meet these goals. By specifying the goals, the government provides good conditions for competition.

27. It was agreed that public authorities should retain the responsibility to review the actions of industry to see whether systems are in place, and to take action against those enterprises that do meet established requirements and goals. (Many enterprises will, in fact, go beyond what is required.) By establishing performance-based laws, public authorities can prioritize their enforcement resources, focusing on those enterprises where their involvement is most needed for the protection of health and the environment.

28. The Workshop concluded that public authorities should give credit to those enterprises that provide evidence of effective management of S, H, E, and Q (i.e., those that established and implemented appropriate integrated management systems) by reducing the number and scope of inspections, or by providing other appropriate benefits.

29. It was noted that the evolution to a performance-based approach to regulation requires good government-industry co-operation and communication.

30. The Workshop stressed the importance of inspectors and other officials being trained to understand management systems. Such training could help ensure consistency in approach. It is particularly difficult for government inspectors to have the necessary training and skills to be able to undertake inspections of integrated SHE and Q management systems. It is important that the inspections focus on the quality of the S, H, E and Q performance, not on the systems. In this regard, it was pointed out a side-benefit of public authorities implementing their own management systems (e.g., according to ISO standards) is an improvement in the general understanding of management systems by their staff.

31. It was agreed that public authorities should also strive to simplify, to the extent possible, legal and regulatory requirements related to SHE and Q in order to avoid duplicative, ineffective or conflicting requirements. In fact, it was suggested that a goal should be the integration of all laws and regulations related to SHE (and possibly Q). It was noted that such efforts would require political impetus from the highest levels. Representatives of industry should make proposals concerning how this could be accomplished.

32. In addition, to the extent possible, various public authorities responsible for protection of safety, health and the environment should co-ordinate their activities to minimize the likelihood that a particular installation has to deal with several, related inspections or reporting requirements. Ideally, there should be one authority responsible for co-ordinating all inspections at an installation, and there should be integrated reporting schemes. However, the public authorities often face the same type of barriers to such integration as occurs in industry, e.g., protection of territory, lack of understanding by the relevant parties, and conflicting mandates.

33. The Workshop discussed tools used by public authorities to facilitate integration. In this regard, one useful system, i.e., the GIS based "Integrated Risk Management System", developed by the KOSHA, was described and proposed as one useful model (add website address).

34. It was suggested that public authorities should consider what changes in laws, policies and procedures may be appropriate in order to facilitate (and not hinder) the further development and implementation of integrated management systems. In addition, public authorities should ensure that the public receives appropriate information about enterprises that pose risks to health and the environment, and that integrated management systems do not hinder the availability of information to be provided to the public.

Management of Internal Operations

35. The Workshop noted that public authorities should consider setting up internal management systems to help ensure the quality of its services, including enforcement operations. In addition, it is important for inspectors, and other relevant employees of public authorities, to be trained to be able to work with enterprises that have integrated management systems.

36. As noted above, the Workshop expressed concern about the lack of co-ordination among the various ministries and agencies responsible for SHE& Q issues, which may create barriers to the efficient implementation of integrated management systems, and is causing duplicative and sometimes conflicting requirements in industry. Such requirements create a drain on available resources without any measurable improvement in SHE or Q. It is important that this message be delivered to high levels of government where there is the authority to take action.

V. Relationship to Other Stakeholders

37. Workers' Representatives: The Workshop recognised that workers and their representatives, where they exist, should play an important role in the development, implementation and review of an integrated management system. As noted, the participation of workers in the planning stages of an integrated management system is critical to its successful implementation. Furthermore, it is also necessary to provide education and training to all employees related to a new management system. .

38. Industry/trade associations: It was suggested that industry/trade associations could promote improvements in management systems by working with public authorities and pro-actively recommending solutions to any issues/concerns, by providing support and assistance to SMEs, by providing a mechanism for the exchange of information and experience among its member companies and others, and by providing a forum for consensus leading to improvements in overall performance.

39. Community and representatives of the public: It was noted that trust and accountability are important issues. This requires a maximum of transparency and communication by industry and authorities to the potentially affected public. The means for communicating with the public differs in different communities but generally industry has an obligation to provide information to the public, and public authorities are responsible for ensuring that effective communication takes place. It was also suggested that an enterprise's management system should identify means for identifying and responding to community concerns.

40. Educational Institutions/Academia: Workshop participants emphasised the importance of education in helping to move towards effective management systems for SHE. It was suggested that there is a need to for multi-disciplinary and inter-disciplinary education and training for both public authorities and industry personnel to understand the processes involved and the benefits to be gained by the development and application of integrated management systems. In addition, schools should help students to understand the nature of SHE risks. Universities have the responsibility to train engineers so that they understand risk and process safety management and how to manage SHE& Q in an integrated way. Universities should also help train others that might be involved in decision-making concerning the management of S, H, E and Q. Therefore, there should be relevant courses in, e.g., MBA and Management School programmes. Academic institutions should contribute to the R & D needed to improve integrated management systems.

VI. Verification and Standards

41. The Workshop recognised that there is not one agreed way to best meet the objectives of integrated management. The participants discussed in some detail the use of different standards and guidance for the implementation of an integrated system. Some participants pointed out that there is a significant benefit in building on existing standards and programmes (such as the ISO standards and the Responsible CARE programme of the chemical industry), while it was recognised that each of the different approaches have advantages and disadvantages.

42. It was suggested that all management systems should be subject to some form of verification/certification, for external purposes including credibility in the community and communication with authorities. It was noted that the process for certification of an integrated system is more difficult than with separate systems, and that many certifying organisations do not yet understand integrated systems.

43. It was also suggested that it may be valuable to consider developing an international standard for the integrated management of SHE&Q. In addition to providing guidance and structure for industry, an

international standard could have the added advantage of reducing the influence of the certification organisations that benefit from increasing number and complexity of standards.

VII. Future Steps

44. The Workshop recommended that mechanism(s) (including, for example, a web-site) be established in order to facilitate the sharing of experience (e.g., successful case studies) of integrated management of safety, health, environment and quality.

45. It was also suggested that public sector organisation(s), trade associations and larger enterprises undertake to assist SMEs by providing technical advice. Consideration should be given to further developing guidance for SMEs related to the development and implementation of management systems.

46. It was recognised that efforts are being made to better align the existing international standards related to safety, health, environment and quality in order to facilitate their application in an integrated way. It was suggested that efforts be undertaken, in the future, to merge the existing standards into one comprehensive standard (recognising, however, that the effort to have an international standard should not be at the cost of interfering with improvements to the standards). The OECD should support effects toward developing an international standard.

47. The Workshop emphasised that the ultimate objective in the development and implementation of integrated management systems should be to achieve sustainable development, with an economy capable of being able to sustain itself indefinitely.

References:

48. The following reference materials was used at the workshop:

- ISO Standards (9000 and 14000 series)
- ILO Guidelines on Occupational Safety and Health Management Systems (ILO/OSH 2001)
- OHSAS 18000 series
- Responsible Care (including ICCA report)

ANNEX 1

OECD WORKSHOP on INTEGRATED MANAGEMENT OF SAFETY, HEALTH, ENVIRONMENT AND QUALITY

Seoul, Korea, 26-29 June 2001

DISCUSSION DOCUMENT

Prepared by Anders Jacobsson, AJ Risk Engineering AB, Sweden

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WORKSHOP ON INTEGRATED MANAGEMENT OF SAFETY, HEALTH, ENVIRONMENT AND QUALITY (Seoul, 26 – 29 June 2001)

DISCUSSION DOCUMENT

1. INTRODUCTION

This Discussion Document was designed to introduce, and to stimulate debate at, the "OECD Workshop on Integrated Management of Safety, Health, Environment and Quality." After the Workshop it has been slightly modified to clarify a few points.

The Document deals primarily with the question of how far the integration of management of the various areas of interest – Safety, Health, Environment and Quality – should be driven, in particular as reflected in the management system. Second, this Document provides some advice on how an integrated management system could be developed, implemented and operated.[4]

In the following Safety, Health, Environment and Quality will be called **disciplines**. For short, the Document will often just use the initial letters of the words: S, H, E and Q.

The main purpose of the Document is to present a view of the value of integrating two or more of the disciplines S, H, E and Q – with the performance within the disciplines as the leading objective and the possible administrative benefits as a secondary objective.

Integrated management in this Document means the incorporation of issues from the different disciplines mentioned into a common way of managing these issues jointly based on common values. Obviously, they can then also be administered with the same formal procedures of the management system.

There are no standard answers to the optimum degree of integration. Even so, the Document tries to give general statements on what might be advisable to do and what not, and raises issues for the consideration of Workshop participants.

However, also in the experience of the author, there are examples that sometimes contradict these generalisations. Therefore, an example of a model that works for one organisation is no proof that it will work for another organisation or vice versa.

The author approaches the design of management systems in a rather general and free view regarding the structure of management systems and does not feel obliged to start with the formal systems and standards which have been commonly described and used.

At this general level no differentiation has been made for private enterprises and for public authorities in this Document. However a short chapter (Chapter "21") deals with the question "Differences between private enterprises and public authorities".

[4] The version of this Document presented at the Workshop contained questions to stimulate discussion. These have been removed from the text and summarised in the Addendum.

It is clear that many organisations have used experience from their quality systems – which normally have been in place first – when developing SHE management systems. This particular aspect was addressed in the Workshop, but is not treated specifically in this Document.

The issue of how public authorities could develop their requirements in legislation regarding management systems, and the degree of integration, is also not dealt with here. The possibilities for developing "integrated" requirements would depend entirely on the basic legislation. The situation certainly differs from country to country. In the interest of the organisations that have to adhere to legislation regarding safety, health and environment, one would hope for as much integration as possible.

Before going any further into the question of integration of quality with the SHE disciplines, it is essential to spell out how the concept of *quality* has been used in this Document, especially as it differs from the way the Workshop decided to define the Q.

The most common perception of the Q concept is that of quality of products and/or services, typically created by manufacturing companies or other organisations. Many of them have also manifested the Q with quality management systems such as ISO 9001/2, which primarily deals with the quality of the products and/or the services of the enterprise. This somewhat narrow concept of quality - the way it is understood by a majority of persons - is how quality (Q) has been used in this Document. It is essential to keep this in mind when reading this Discussion Document.

There is also a much broader concept of quality – a total quality management concept (TQM) – which the Workshop, during the course of the four-day-meeting, decided to use as its definition of Q. With that definition of Q it is self-evident that Q is an integral part not only of SH and E but also of essentially all other areas of activities within an organisation. With that as a prerequisite there is in essence no need to discuss the level of integration, because Q is then integrated in everything by nature.

2. WHAT DO WE MEAN BY INTEGRATED MANAGEMENT?

Some people mean that they have an integrated management system as soon as they have managed to bring together work instructions for most of the activities in an organisation in the same format; or when they have put ISO 9000 and ISO 14000 into one common system.

In the opinion of the author, integrated management is when the management of the included disciplines – e.g., S, H and E – are based on the same values and principles. Then, it should also be possible to combine – integrate - common or similar elements of two or more management sub-systems resulting, e.g., in one common procedure per activity in the business within the overall, common management system. This Document should be read with this concept for integration in mind.

It is implicit in the case of an effectively managed integrated system that the performance of the regulated activities will improve as well as result in more efficient administration of the paperwork.

3. INTEGRATION OR NOT – A PRINCIPAL APPROACH

Integration of Safety, Health and Environment, along with the possible integration of Quality, into one common management system has several advantages, but there could also be disadvantages which one has to be aware of.

For many people the question of integration of management of Safety, Health, Environment and Quality is very simple to answer. Of course they should be integrated – S, H, E and Q – or whatever. They are all parts of the total management system for the enterprise or the public authority, and they just shall be integrated.

However, too much or uncritical integration is not really desirable. A high degree of integration might look very efficient on paper. However, in the interest of the basic values of S, H, E and Q that we want to promote, it is often not the optimum way because it can result in a loss of focus on the various individual elements.

As long as S, H and E aspects along with Q aspects are all given the appropriate attention, the structure of the administrative management system should not matter too much. However, in the tough business climate today we both have to obtain sufficient results in the discipline of interest and, at the same time, minimise the cost for achieving it, so there is a strong driving force for rationalising the management system.

The thoughts and opinions in this Document are primarily based on the idea that the actual outcome of S, H and E should be optimised as a result of the management and the system used for that. The fundamental idea is not how to rationalise and minimise the cost for the administrative process as such by using a certain management system.

Furthermore, S, H and E should be essential parts of the values of an organisation, and therefore these basic values should have an active lead/influence in the work. Managing S, H and E, regardless of the degree of integration, is not primarily a question of satisfying an external standard.

As discussed later in this Document, it is suggested that:

- Integration of S, H and E should be encouraged – without any hesitation.
- Integration of SHE with Q should be treated with care.
- The Responsible Care concept should preferably be used as an overall governing system.
- Generic issues should be integrated and streamlined as far as possible in common procedures, whereas procedures specific for only one of the disciplines, say a health issue, should only deal with this but be documented in a standardised way similar for all procedures in the total management system.
- The overriding success factor for a management system – regardless of degree of integration is top management commitment and involvement.

Integration, solely at the administrative level (meaning using the same formats for documents, having the same document control system, using a similar system for management review, etc.), normally does not pose any major problems, but it also gives only limited benefits.

Problems often arise when one tries to integrate many disciplines at a detailed level (meaning e.g., using the same procedures, operating instructions, non-conformance, records, etc. to cover all disciplines and aspects); then very often the system tends to lose its focus on important aspects.

An integrated approach normally means that the organisation itself can take command of the development of the system, and is not driven by a specific standard and its certification auditors.

An integrated management system should of course be possible to certify according to wish. However, the certification/ registration cannot be the main objective for an organisation to develop a SHE or Q management system. One would hope that the driving force is a genuine desire to improve the SHE+Q work by introducing such a management system.

An integrated system, not bound to a specific format of a standard, is easy to adjust when new legislation appears.

Figure 1

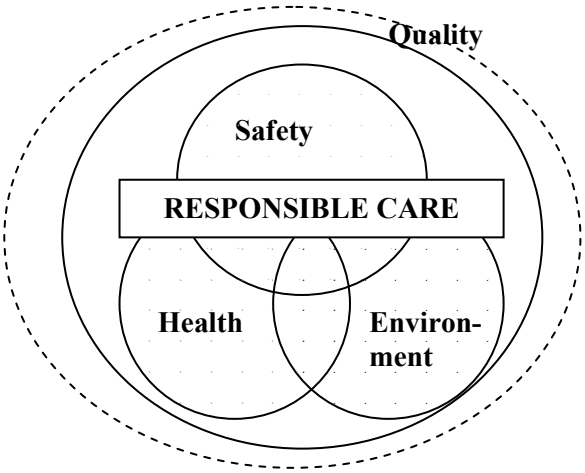


Figure 1 shows the way the author anticipates the interrelationship between the disciplines of S, H and E, i.e., with a lot of overlap. As an umbrella over the three is the concept of Responsible Care. Quality is more loosely connected to S, H and E in its basic values, but could be applied to all disciplines in a sense.

Figure 2

Integration of Safety/Health/Environment					
Health				Environment	
	Safety				
Individual health needs	Work-related illnesses	Work accidents	Risk of major accidents	Acute environmental impact	Long-term environmental Impact

Figure 2 shows one way of expressing the various elements of Safety, Health and Environment, showing how they overlap. The overlap signifies the rational for integrating the management of the three disciplines.

4. MANAGEMENT SYSTEMS – NOTHING MAGIC

Management systems are nothing magic or even new; such systems came on the stage in the 1980´s, typically in the form of ISO standards. A management system is simply a lot of common sense put into a formal dress – bringing better order and structure to the way things are managed.

It is in many ways "old wine in new bottles". It is a way of describing what shall be done and normally also how, when and by whom.

The famous "management loop" (as stated in the right hand column below) is what is done or at least should be done all the time.

We have always had to	**MANAGEMENT STEPS**
1. decide what we want to achieve	**POLICIES**
2. think how we shall accomplish it	**PLANNING**
3. carry it out in an efficient and responsible way	**IMPLEMENTATION**
4. check that it has been carried out in the right way	**CHECKING**
5. learn from mistakes	**CORRECTIVE ACTION**
6. have assessment by the management	**MANAGEMENT REVIEW**
7. and repeat the loop from point 1.	

This is also known as Plan-Do-Check-Act.

You can also say that management can basically be formulated as: "Say what we do, do what we say, and show that we did it".

The only difference, more recently, is that management systems of various kinds put more focus on the structure of the steps and are demanding that the organisation proves that the loop is run through and becomes closed, normally with the goal to continually improve performance.

Existing formal management systems, of the type of ISO 9000 and 14000, are based on a documenting, bureaucratic tradition.

One of the reasons for the appearance of the environmental management system ISO 14001 and some similar systems for safety and health is that there are strong financial interests from many stakeholders in the business of consulting for design of systems and for certifying of systems. Therefore, it might be that these systems are not necessarily designed primarily for the best benefit for the organisations applying them, but also for these other stakeholders. The emphasis in these systems is on formal things, copying the formal accountant style of ISO 9000 on quality.

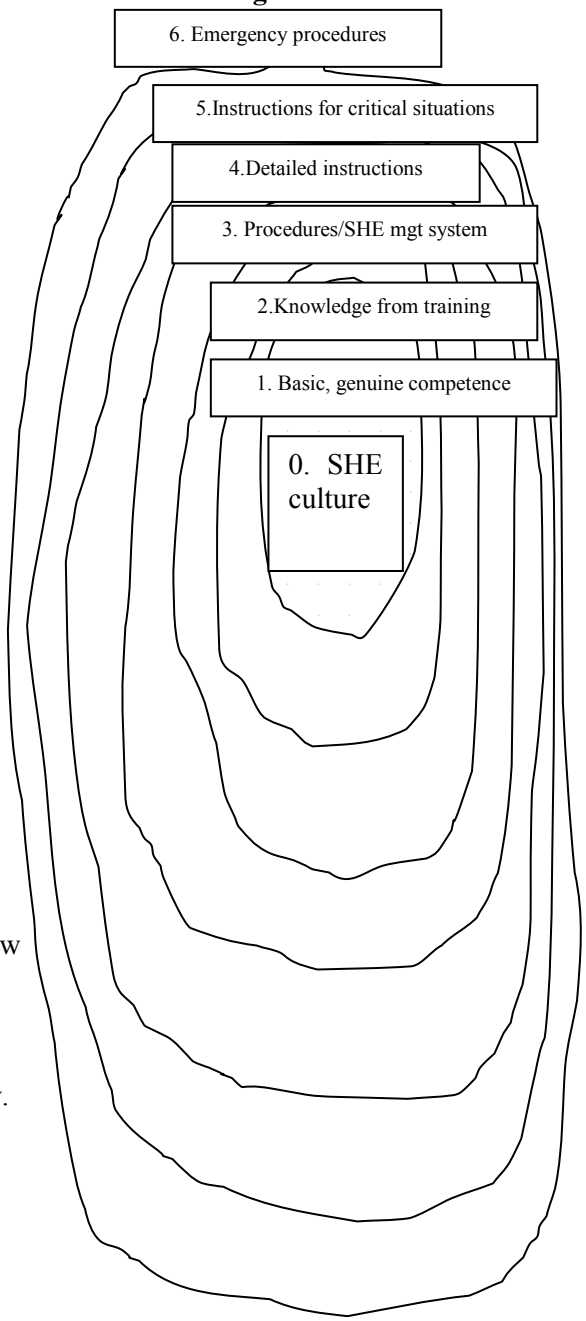
It is therefore time to play down the issue of management systems in the more formal sense and raise it in its role as a means of achieving excellence in the disciplines of S, H and E.

5. DO WE REALLY NEED FORMAL MANAGEMENT SYSTEMS FOR SHE AT ALL?

In the process industry, it is a well-known approach to show the safety of a dangerous installation or operation as a number of consecutive layers or barriers of protection outside the process equipment itself. The innermost layer is the basic design of the process, where it is desirable to have "inherent safety". An inherently safe process is safe, regardless of what happens, because it has so little of the dangerous material, or uses no harmful material, or uses them at such conditions that there is no risk from them.

The protection layers following on are, e.g., safety integrity systems (normally electronic interlock-systems stopping a process), pressure relieving devices, emergency response actions, etc. The same thinking could be used for the non-technical issues for the management of SHE in the organisation. This is illustrated in Figure 3.

Figure 3



0. A well established SHE culture is necessary to obtain "inherent safety" in an organisation. It is the foundation for a successful management.

1. In the next layer to maintain a high level of SHE one can visualise a good basic competence in general and in SHE in particular among the employees. This is founded when recruiting people to the organisation.

2. The next layer consists of general and genuine knowledge obtained by thorough training within the organisation, which leads to that every employee understands exactly how the work should be performed in a safe and environmentally correct way.

3. The next layer consists of general procedures for how certain types of work shall be performed. Training in these procedures is included.
   This is normally the main layer for the SHE management system with its procedures.

4. The layer outside consists of detailed instructions on how specific equipment shall be handled in a safe and environmentally sound way. As above, training is included in this step.

5. Outside this there is a layer with specific instructions on how to perform in certain critical situations to avoid these to develop into real emergencies. Training is again included.

6. Finally there is a layer with overall procedures on how to handle emergency situations, both internally and externally. Training and exercises are included.

If we have a genuine culture for the relevant disciplines (e.g., Safety, Health and Environment) permeating the whole organisation, every employee would do the right things without a big system with procedures and detailed instructions. This is utopian, but at the same time it is one of the absolutely most vital issues, which must not be forgotten when discussing management systems.

The management system can never replace the fundamental aspect of having a sound SHE culture in the organisation. And this culture is not accomplished by the introduction of a management system as is often believed. If the culture is not there from the beginning, the formulation of a management system will not create it. But if it is there, the management system can help in strengthening it.

The figure presented above could also be a picture of the different cultures that can prevail in an organisation.

Organisations which predominantly manage their activities through applying the layers 4-6 (relying on detailed instructions) have a "Rule-book" culture, those mostly applying layer 3 (relying on general procedures) have a "Procedural" culture, and those applying mostly layers 1-2 (relying on genuine competence and training) have a "Behavioural" culture.

Various organisations have come unequally far in applying the different layers. Furthermore, it is normally the case within one and the same organisation, that various disciplines have different cultures and have come differently far on the way to a truly behavioural culture.

6. MORE REASONS FOR MANAGEMENT SYSTEMS FOR S, H AND E

Managing the SHE policy of an organisation in a professional way should be as natural as managing production, marketing, personnel, and economy and finance. Therefore, formal systems and tools are needed for this along with other general management systems of the organisation.

The SHE policy of an organisation is often more or less formally transferred into scattered instructions. Some organisations have built up a culture within one or more of the SHE disciplines through long tradition.

Most organisations need to gather and regulate the SHE questions in a structured way by a specially designed system, in order to transfer its overall policies to concrete actions for the employees.

i. Poor management is often the root cause of accidents

Analyses and investigations show that weaknesses in the management of operations is one of the most common causes of accidents. It is often found that there is everything from lack or weaknesses in procedures to poor adherence and poor follow-up of the procedures by the management.

ii. Explain and make clear norms and principles

A SHE management system allows the management to show its basic principles and its commitment to SHE. A formal SHE management system contributes to the structure and unity of SHE issues.

iii. Marketing and regulatory driven requirements

The interest in management systems has increased considerably recently with market forces of various kinds and some regulatory requirements driving the development. Within the environmental discipline, standards such as ISO 14000-series and the EU-directive EMAS, have made many organisations decide to develop and certify/register management systems according to these. Many countries have legislation which require Safety management systems to be set up.

Examples of regulatory demands on management systems can include:

- Process Safety Management System (OSHA and EPA in the US);
- Safety Management System (Seveso-Directive of EU);
- SARA Title III (US).

iv. Increased credibility

The implementation of a SHE management system leads to better relationships and increased reputation and credibility within the organisation among both employees and union organisations, as well as externally such as with authorities, neighbours, community, media and competitors.

7. WHAT ARE WE AIMING FOR WHEN INTEGRATING MANAGEMENT OF SAFETY, HEALTH, ENVIRONMENT AND QUALITY?

- Is our goal to rationalise the ever increasing flora of bureaucratic systems thrown upon us, in order to survive?
- Are we interested in improving the result of our S, H and E efforts?

As already stated in the beginning of this Document, we should not be aiming for a system primarily for compliance with a formal standard, resulting in nice certificates in the reception hall and board room, but for a management system that helps in achieving better performance in S, H, E and Q, and enhancing the culture in these disciplines.

8. COMMON DRIVERS/DENOMINATORS FOR S, H, E AND Q

S, H and E are all driven by care for man and nature. From the perspective of the organisation this is an altruistic approach, and not necessarily in the immediate interest of the share-holders (of an enterprise).

Q is driven by economical reasons. It is customer driven, and it could be a prerequisite to be able to sell the products and/or services of the organisation or at least a tool in the competition. It will increase the profit of the organisation. It is egoistic from the standpoint of the organisation. (The reader is reminded of the definition of quality used in this Document)

In many respects we have the same underlying factors for S, H and E, namely avoidance of:

- Accidental releases, which will affect both man and environment; and
- "Normal exposure" to harmful materials, which can affect both man (occupational health) and the environment.

Sometimes there is a conflict between the two, S/H and E, in that a safer workplace can damage the environment and vice versa.

There is a slightly different focus between S and H on the one hand and E on the other hand. Safety and Health is primarily directed towards the employees but also neighbours, whereas Environment is directed more to "society" and neighbours.

Quality on the other hand is directed primarily towards customers.

A strong driving force for S, H and E is of course the legislation of the three disciplines.

In some countries the legislation of S, H and E is reasonably harmonised, and therefore invite an integrated approach, whereas in other countries this is not the case at all.

9. BENEFITS OF INTEGRATION

To a very large extent the same general principles are used to manage the operations in terms of S, H and E. It is therefore logical to integrate these three disciplines into one common management system.

Separate management systems for S, H, E and Q would require many similar or identical parts, e.g.:

- delegation of tasks (responsibility questions);
- adequate competence and training of personnel;
- operating instructions/control, measurement and documentation;
- auditing.

So, instead of duplicating work, there is a lot to be gained from combining the common parts at least.

One big benefit of integration is that it will lead to an increased, and also more balanced, focus of the integrated disciplines and thereby improve the quality of the SHE work.

Managing these questions in an integrated way will be more cost-effective, because there will be considerably fewer documents to keep track of, to up-date and to train people in, and for the employees to follow.

An integrated management system would (provided the integration is done at the right level, etc.) turn out to be efficient for the whole organisation. Compared to having separate management systems, the integrated approach will result in:

- Better focus on ownership and accountability, because the ownership is felt more by the individuals of the organisation (when developing your own integrated system and not having anything thrown upon you according to a certain standard).
- Enhancement of an holistic view and facilitation of priorities for the line management.
- When there is a conflict between the various disciplines (e.g., S/H and E), an integrated management system could help in resolving this conflict in an optimum way.
- Common procedures, leading to:
  - better clarity
  - less training time
  - less documentation
  - less administration
  - reduced auditing
- More flexibility in the system (provided properly made), and readily adjusted, when new legislation or some other demands appear.

10. IS THERE MONEY TO EARN ON INTEGRATION?

The increased efficiency in general in handling the SHE issues, as outlined above under BENEFITS OF INTEGRATION (Chapter "9"), will of course also have economic advantages because there is a more efficient administrative system for handling many similar issues.

However, the big economical advantage is that good SHE work also gives good reliability and performance of the processes and activities of the organisation, especially in the case of an industrial enterprise. A safe unit (against accidental releases and occupational diseases) is also a unit running with high reliability and productivity with:

- more efficient production and maintenance as a result of fewer operational disturbances, fewer releases, less absenteeism, etc.;
- more effective project activities and simplified start-up by considering SHE questions at an early stage;
- better relationship with customers and suppliers; and
- better relationship between employer and employees.

Therefore, good SHE management is also good for the business.

So, there should be all reasons in the world for the top management to be interested in the efficient management of S, H and E.

An even further integration of the management of SHEQ disciplines with management of other business activities could well enhance the profit even more. However, this Document is not dealing with optimising the economic result as such by integrating SHE and Q even further into the business.

11. DISADVANTAGES OF INTEGRATING S, H and E

There may also be some disadvantages in the integration of S, H, and E.

i. Loss of focus – levelling down

There is a slight danger of getting some points unclear and losing focus on one discipline in favour of another one. Levelling down, meaning that all disciplines are adjusted to the level of the least developed discipline, is more probable than levelling upwards!

ii. Unbalanced focus – depending on level of application

Depending on the level in the organisation where the integrated SHE management system is applied, focus would tend to vary and could well become unbalanced. When it is applied from a local level

(e.g., individual plants) the occupational health issues tend to dominate, and more global environmental issues are neglected, whereas the opposite may be true if the system is applied from a corporate level.

iii. Different legislation

When the legislation is different for every one of the three disciplines, an integrated management system could create some difficulties for the clarity on how the different requirements in the individual legislation is satisfied.

iv. More complex audits

It will be somewhat more difficult for an authority or a certifying body to audit an integrated system compared to tailor-made systems for every discipline. This is, however, more than out-balanced by the above-mentioned advantages for the organisation. There are clear signs that at least some of the authorities are interested in seeing integrated systems in organisations, with authorities making more integrated inspections.

12. DISADVANTAGES OF INTEGRATING SHE + Q

When SHE and Q are integrated normally there is already a Q system available. The belief is that Q will carry the SHE with it. This might be so to a certain extent, but it is more likely that SHE will not bloom to its proper extent. Focus on SHE is often lost when being formally included in a Q system. There are many examples of Q dominating the integrated management system where SHE is included.

There are, of course, organisations that have built Q systems based primarily on their natural activities in the same way as advocated for in this Document. Then there is a good chance that an integration can work out well with a balanced focus on all the disciplines. However the majority of Q systems follow the ISO pattern closely, and then – based on the experience of the author – one should be very careful with integrating SHE with Q, especially in the form of ISO 9001:1994, because this is lacking some fundamental aspects which are vital for SHE, such as:

- Continual improvement in performance;
- Compliance with legislation;
- Application to other stakeholders than customers and suppliers (not employees, the community, authorities and the wider environment);
- Considerations to risks, abnormal conditions and emergencies.

The new version of ISO 9001:2000 is better in that it talks about continual improvement and compliance with legislation.

13. INTEGRATION WITH YET OTHER BUSINESS FUNCTIONS?

Depending on the circumstances and the way an organisation operates, there may be opportunities for further integration. Possible disciplines that could lend themselves to successful integration with S, H and E are, e.g.:

- Product stewardship;
- Security;
- Risk management in general.

However, the important thing is again that the disciplines to be integrated share common values in the way they are managed.

14. OBSTACLES/DIFFICULTIES OF INTEGRATION

There are always some barriers between the different disciplines, which are subjected to integration – differences in cultures, differences in objectives, and, probably most important, the unwillingness of people to give up the hegemony of their own discipline.

i. Different cultures in various disciplines

As mentioned under the chapter of "DO WE REALLY NEED FORMAL MANAGEMENT SYSTEMS FOR SHE AT ALL?" (Chapter 5), there are normally different cultures in the various disciplines in an organisation.

These differences are in themselves a difficulty in an effort to integrate. For an integrated management system to be successfully implemented there should ideally be the same culture in all the disciplines that we want to integrate. If the cultural differences are too big, it will not be possible to overcome these by creating an administrative system of common procedures called "Integrated management system for XYZ". For the organisation to act in an "integrated way" as supposed by the management system, we can only integrate these disciplines with the same or at least similar cultures, or first we have to create this common culture. If this requirement is not fulfilled, we run a big risk of levelling down all disciplines to the least developed culture (e.g., a "rule-book" culture) rather than levelling upwards (towards the "behavioural" culture).

An existing strong culture and management system in one discipline can hinder integration of other disciplines or dictate the conditions for integration too much.

ii. Different focuses, objectives and requirements

There are also different focuses, objectives and requirements of the various disciplines. These are often inter-related and sometimes they can be conflicting. In case of a conflict, it is necessary to accept that the objective of one discipline must overrule that of another one.

As an example we can take the chemical process industry where there is a tendency for safety being the top priority objective. The discipline of safety then tends to set the level of all the other disciplines in an integration process.

In the manufacturing of most consumer products, quality is probably the governing discipline and sets the level for others in an integration process.

In an integration process there will be difficulties if disciplines with too different objectives and requirements are forced to be integrated, unless these different requirements are recognised and resolved in a proper way. Most disastrous would be if the objectives of a "secondary" discipline for a particular organisation is forced upon the organisation. This will result in a non-efficient integrated management system as far as actual performance is concerned (administratively it could still look good).

Referring to the two examples above it would be unwise to force Q-system objectives onto Safety, Health and Environment for a chemical process industry, and equally unwise to force SHE system objectives onto Quality for a consumer goods company.

iii. Complexity and size of the organisation

Every enterprise or public authority has its unique organisation. The way it is organised will of course have a major impact on how the integration process would proceed. The more complex the organisation and the more fragmented the various disciplines which are going to be integrated, the more difficult it would be to reach consensus and implement a big integrated management system.

The biggest challenge is probably in the way the line organisation is set up (size, geographical spread, business lines, matrices, etc.) and the key manager´s opinion of, and commitment to, the integration concept and SHE and Q in general.

In addition, the way the specialist functions for the SHEQ disciplines are organised is important. If these functions are spread out on many managers there will certainly be more difficulties to overcome than if the disciplines that we want to integrate are headed by one manager.

It is likely that big organisations will have bigger problems to overcome in the respects indicated above.

iv. Protection of territory

Probably the biggest hurdle to overcome in many cases of well-founded integration of disciplines is the resistance of many managers, specialists and other employees to changes and the intrusion into their territory.

v. Minor hurdles

- Internal audits will be a little bit more awkward and require more competence to cover all disciplines; on the other hand, it will save a lot of time by just having, e.g., one audit instead of three.

- Also external audits, e.g. certification audits, will be somewhat more complicated.

- Conveying information to certain external stakeholders (authorities and customers) only interested in one issue, will be somewhat more complicated.

15. STRUCTURES OF MANAGEMENT SYSTEMS

There are basically two different approaches to regulate the activities of an organisation:

i. The generic concept

The management system starts from generic activities, such as:

- Planning;
- Implementation;
- Control;

and tries to arrange the natural activities of the organisation under these headlines.

The ISO 14001 system is a typical example of this approach.

ii. The activity-based concept

The management system starts from the natural, concrete activities of the organisation, such as:

- Transfer of a chemical production method from laboratory scale via pilot scale to commercial scale;
- Carrying out projects;
- Carrying out maintenance of equipment;

and based on those are relevant phases applied such as:

- Planning;
- Implementation;
- Control.

The approach suggested, e.g., by the Centre for Chemical Process Safety (CCPS) in the US is of this latter type.

The quality standard ISO 9001/2:1994 is in the opinion of the author something in between the two types. The new standard ISO 9001:2000 has approached the latter type more. It is now talking of processes as the basis for setting up a quality management system. It now also asks for continual improvement and has relaxed some of the requirements on very stringent documentation. It also makes an attempt to couple with the ISO 14001 standard for Environmental Management Systems.

There seem to be different approaches in various parts of the world. With the risk of being too general, it could be said that North America appears to go a more pragmatic route and uses the activity/process based concept more, whereas Europe seems to be more formalistic and uses the first route with generic activities more.

There are a large number of various suggested management systems. This in itself is an indication that there is not one perfect way to tackle the question of how to manage the four disciplines S, H, E and Q.

16. EXAMPLES OF "OFFICIAL" MANAGEMENT SYSTEMS

i. International standards

Examples of widely used international standards for management systems are:

- ISO 9001/2, Quality management system (European standard) + specific standards for various types of businesses;
- ISO 9001:2000 and ISO 9004:2000 Quality management system (European standards);
- ISO 14001, Environmental management system (European standard);
- EMAS, Environmental Management and Audit Scheme;
- BS 7750, Environmental management systems (British Standard);
- OHSAS 18001 (not official standard), Occupational health and safety management systems (until now rather limited experience).

No official standard exists today for any integrated management system. Some years ago there was an initiative from Norway to produce a standard for QSHE, but the effort failed. The Norwegian proposal was called "Management principles for enhancing quality of products and services, occupational health & safety, and the environment". However it was only partly an integrated system. There were three annexes, one for quality issues, one for health & safety issues, and one for environmental issues. This shows that there are considerable difficulties in making general systems with full integration.

ii. Requirements on management systems in legislation

In many countries there are legislative requirements for certain organisations to have formal management systems. Some examples are:

- Occupational Safety and Health Administration and Environmental Protection Agency in the US (Process Safety Management System);
- "Seveso Directive" in the European Union (Safety Management Systems);
- Similar systems in other countries.

The organisation can choose to make a tailor-made management system (sometimes even more than one system) to satisfy the legislative requirements. The other alternative is to refer to the management system(s) the organisation already has for its own purposes.

The fact that there is a trend towards more legislative requirements of management systems both in the area of safety/health and in the area of environment naturally increases the interest for the integrated approach when building management systems, in order to minimise the administrative burden.

iii. Adapted systems for certain stake-holders

There are a number of systems developed by various organisations, e.g:

- CCPS (Centre for Chemical Process Safety, US), **SH, SHQ;**
- CIA (Chemical Industries Association, UK), **Responsible Care, SH;**
- EPSC (European Process Safety Centre), **SH, SHE;**
- E&P Forum (Oil Industry International Exploration and Production Forum), **SHE;**
- ACC (American Chemistry Council,US)—formerly known as the Chemical Manufacturers Association, **Responsible Care, SQ;**
- API (American Petroleum Institute), **SH;**
- CONCAWE (The oil companies´ European organisation for environmental and health protection), **SHE;**
- CEFIC (European Chemical Industry Council) **Responsible Care, SQAS;**
- ILO (International Labour Organisation), **SH.**

When these organisations have developed systems suitable for their members or other stakeholders, most of them have turned out to be of the activity-based concept.

That seems to support the idea that each organisation would benefit from building its integrated management system based on its own main activities rather than on the generic concept (presented in the previous chapter).

Regardless of the management system they all seem to have many things/procedures in common. Among these are:

- Organisation and responsibilities;
- Education and training (general);
- Document control system;
- Management review;

- Non-conformance & corrective action;
- Records;
- Auditing procedures.

There are of course all reasons to have at least these parts in common for the various management systems that the organisation needs, regardless of how much other integration is chosen.

17. RESPONSIBLE CARE AS A COMPREHENSIVE MANAGEMENT SYSTEM

The most comprehensive system to cover SHE issues is the Responsible Care programme. It is not a full management system, but a rather detailed frame-work for it, and it could well be a base for an integrated management system for S, H and E.

As seen in the list of "Adapted systems for certain stake-holders" (above), some organisations have developed integrated management systems either based on or incorporating the Responsible Care programme. These systems, however, have not become widely used (according to the knowledge of the author).

On the other hand, the concept of Responsible Care is widely used in North America (USA and Canada), New Zealand and South Africa. The Responsible Care system according to the US American Chemistry Council (ACC) has six Codes of Management Practices:

- Employee Health And Safety;
- Process Safety;
- Distribution;
- Product Stewardship;
- Pollution Prevention;
- Community Awareness and Emergency Response.

18. HOW FAR SHALL WE INTEGRATE?

This is the key question. It is obvious that some integration is desirable and necessary and will bring benefits without risking any performance of any discipline involved. However, what is an optimum? This will depend on the circumstances for each organisation.

- Total integration of SHEQ

  Difficult, Needs a conceptual model.

- Common procedures for SHEQ and other documentation

  Written as common procedures but could still in essence be handled as separate things, when desirable.

- Certain common generic procedures

  For example, common SHEQ policy, organisation and responsibility, goals/objectives and action plans, documentation control, management review, general training, non-conformance & corrective action, and auditing procedures.

- Limited activities

  Only certain activities treated as integrated, e.g., handling of investment projects.

Generic activities that are truly common or very similar for all disciplines, regardless of how much other integration is chosen, should of course be included in integrated procedures.

19. MODELS FOR THE INTEGRATION PROCESS

In building an integrated system, various models can be chosen, such as:

- Develop the integrated management system from scratch, disregarding existing systems.

  Would result in the ideal system, but is very time-consuming

- Review existing management systems, decide on a reasonable common structure, and add features needed to accommodate this.

  Would normally be an efficient way, but could lead to a system biased towards the system most developed at the start.

- Develop the various sub-systems in isolation and then integrate them.

  Each system/discipline gets its necessary attention, but the integration process could be difficult and uses a large amount of resources.

20. VARIOUS INTEGRATION OF DISCIPLINES AT DIFFERENT LEVELS

A common way of describing the hierarchy of a management system is with a triangle with the policy at the top, followed by a layer of procedures and, at the bottom level, the detailed instructions. Sometimes the management system also has a manual or handbook, which is a kind of guidance to the system.

Integration of disciplines could vary depending on the level in the system. So, e.g., the detailed instructions could be said to be totally integrated, the procedures partly integrated, and the manual and the policy sometimes integrated to a lesser extent.

21. DIFFERENCES BETWEEN PRIVATE ENTERPRISES AND PUBLIC AUTHORITIES

Most of what has been written in this Document would apply for private enterprises and public authorities alike, when there actually are major issues within all the various disciplines. This would, e.g., be the case for manufacturing companies within the process industries and many other types of enterprises.

However, if the organisation in question does not have activities which contain significant risks for immediate or delayed danger to health for own employees or people in the surroundings, or do not have any serious environmental impact, the reasoning around the integration of the management system would change.

If, for example, a public authority does not have any really risky activities, but only has more or less an administrative, office-based organisation, there is of course quite another situation as compared, e.g., with a manufacturing industry. In this case, the management system becomes much more focused on administrative issues. Then the warnings of cautiousness when integrating SHE also with Q are not equally important. If there are no major S, H or E issues to safeguard, there are probably all reasons for integrating SHE with Q, and perhaps even more disciplines, in order to get the administrative benefits out of it.

22. DEVELOPING A MANAGEMENT SYSTEM – SOME KEY ISSUES

For a SHE management system to be successfully implemented and become well- established there are a number of principles that must be followed at the development stage. Some of the most important are:

- Sell the concept to the top management, including the organisation´s managing director, and ask for active support and involvement;
- Appoint one person who can work as the "prime mover" for the project;
- Involve the whole organisation in the work;
- Work through a project and/or a steering group;
- Make a time schedule with targets and sub-targets;
- Build the system on existing procedures.

i. The involvement and support of the management

The success of a SHE management system depends on the involvement of the top level of the organisation. The organisation will act based upon the priority it believes the management has given the project.

The managing director/site manager must go out and speak on behalf of the system and show that he/she really professes to the basic ideas. The management must show a sustainable involvement; it is not enough just to start the process. It is therefore crucial for the management to guarantee resources for the

build up, implementation and operation of the management system, in terms of monetary and personnel resources. To follow the development and the implementation of the management system is an obvious task for the management group in their regular group meetings. The status of the SHE+Q work should also be reported at the board level.

ii. Involvement of the whole organisation

Involving the whole organisation means, among other things, that the organisation is trained during the project time and, most importantly, that personnel are actively involved in developing the procedures. The personnel must have the opportunity to say how they can work with the SHE+Q questions. The system is more or less doomed to fail if this is not done during the build-up phase.

iii. Project organisation and "prime mover"

A project organisation is needed to carry out an integrated management project.

At the top of the project organisation is a project manager. This is probably a half-time job at least, during the development and training phase. This person should be the "prime mover".

A project group with a representative mix of people is also needed. The people in this group should contribute to developing the procedures of the system and, at the same time, the anchoring of the procedures and the chosen ambition level in their respective departments.

Finally, personnel resources in all departments are needed as bodies for consideration/reference as the work progresses.

More or less formal groups consisting of foremen and operators/technicians, etc. and union representatives are needed as bodies for consideration during the work.

iv. Time schedule

The introduction and implementation of an integrated management system must be done according to a time schedule with matching resources. The time from the decision to start developing the system until the whole system is implemented ranges from six months to several years depending on how much of the procedures and other material is already available to build upon, and also the resources that the organisation is prepared to put into the project. The big time consuming activities are:

- SHE+Q assessment (initial);
- Development and construction of the system with the procedures;
- Training and involvement of the personnel from the whole organisation;
- Detailed regulation in instructions at department level (if this is considered necessary).

Before a possible certification/registration can be undertaken, the system must have been running for a certain period of time - estimated at six months.

v. Build on existing systems - start with initial assessment of current situation

An integrated management system should build upon existing foundations, which the organisation has within the various disciplines. Sound written or verbal rules and instructions, which are already applied, should be used as important corner stones in the new system. Use existing material as far as possible.

A first step in developing a complete integrated management system is to make a survey of existing work, procedures and documentation in the organisation. Such a survey can be carried out with, for example, the assistance of some recognised SHE+Q auditing method. This first step can be called an "initial assessment". The result can be compared with the proposed contents for an integrated management system. A first estimation is then obtained as to which disciplines and to what extent work has to be carried out to arrive at the comprehensive integrated management system.

vi. Paper or electronic systems

The choice of a documentation form for the system should not have any principle influence on its success or failure. If the organisation already has well-developed procedures available electronically then it would be advantageous to put the integrated management system in such a form too. One advantage of a paper-free system is that it is much less probable that employees will use old documents. However, if the organisation has not come so far in the use of computerised systems, paper-form for the integrated system would be the obvious choice. However, it is inadvisable to develop and introduce an integrated management system at the same time as developing an electronic system.

23. IMPLEMENTING A MANAGEMENT SYSTEM – SOME KEY ISSUES

A very critical point comes when the management system is implemented. This is the case even if many employees have been involved in developing the procedures. There are many questions such as: How will the system be received? How well will it be followed? Which training is needed? Which control and follow-up is needed?

So, therefore, a lot of attention and pre-planning should be given to the implementation. The project management and the line management have to put in extra resources during the actual implementation of the management system and a renewed drive for motivating the personnel is advisable.

i. Stepwise implementation

In larger organisations, the management system can be introduced at one unit first as a pilot case, before it is introduced in the whole organisation. In smaller organisations, it is normally better to introduce it in the whole organisation at once. However, it is wise to introduce the system in steps rather than all at once and build the experiences from the first introduced procedures into the procedures which are still under development.

Although there are various strategies, from starting with the simple procedures to starting with the most challenging ones, it is probably advisable to select some procedures which have the potential to be well received - not too controversial and not too self-evident.

ii. Follow-up

The project manager must very closely follow how the first procedures are received and work in practice by interviewing employees of all categories and following up the formal handling of documents, etc. One should try to quantify the results versus the resources put in. The follow-up should continue until the process is established within the line organisation.

iii. The line organisation responsibility to follow the system

The line organisation takes on a big responsibility in following the implementation of the integrated management system.

iv. Training

Before or during the implementation of the management system, training of all personnel is needed including:

- managers;
- other employees;
- contractors, hauliers.

It is advisable to allocate considerable resources for training. The formal part of the training can vary from some hours to some days, but there will also need to be a lot of informal training and discussions in the organisation.

24. KEEPING A MANAGEMENT SYSTEM RUNNING – SOME KEY ISSUES

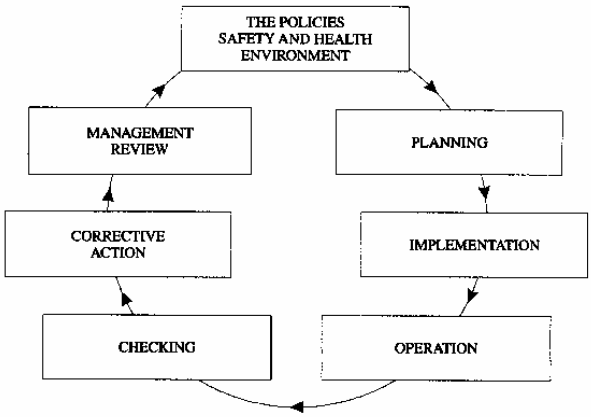
The introduction of just a set of procedures is clearly not enough to have an integrated management system in operation. A number of steps are needed with the overall goal of "continual improvement". A common model to present SHE+Q work is according to a closed circuit - starting with the policies; going through planning, implementation and operation; checking and corrective action; and management review - to arrive at continual improvement. See Figure 4.

It is only when the whole "loop" is completed that the system can be considered to be in operation and mature enough for a possible external audit. For the SHE+Q work to be successful some activities are required:

- continuous measurement of improvements;
- periodic control in the form of internal and external auditing;
- continuous training and motivation of personnel.

Responsibility for managing the system **Figure 4**

A prime mover, such as the manager of the organisation´s SHE+Q function, must continuously be responsible for supervising, controlling and developing the system.



25. INDEPENDENT AUDIT AND CERTIFICATION/REGISTRATION

There could be several reasons for an organisation to certify its management system(s). By a certification or registration, the organisation is acknowledged to have included the requirements of a certain system/standard and that these requirements are followed. However, it does not tell very much about the actual level and quality of the SHE+Q work.

The certificate can simplify communication with external stakeholders. Already today a growing number of customers require their suppliers to be certified according to ISO 14001 or OHSAS 18001 (BS 8800) or registered according to EMAS, and obviously according to ISO 9000 for quality.

Some authorities have indicated that they would sometimes be prepared to accept that certified/registered organisations have a certain good basic level and, in the future, fewer detailed inspections will be made of such organisations.

It is important to emphasise that certification/registration cannot be the main reason for an organisation to develop a SHE or Q management system. There is hopefully a genuine desire to improve the SHE+Q work by introducing such a management system.

Some of the most important conditions to get a certification or registration are:

- the system shall be in operation;
- the system shall fulfil all the requirements according to the standard and the legislation;
- the system documentation shall be in good order - this applies to both controlling documents and recording documents.

In order to ensure that all detailed requirements in the standard or the directive have been included in the integrated management system, it could be appropriate to make a reference key between the

"official" system and the system of the organisation. Such a key would also greatly assist the work of an auditor.

26. CONCLUSIONS AND RECOMMENDATIONS

The following are conclusions, recommendations and considerations seen with the eyes of the author on how integrated management systems for S, H, E and Q could be developed and used.

Based on what has been said earlier, it seems reasonable to conclude that:

- The superior objective of a management system is to help in the process of creating and improving a culture in the respective discipline.

- Integration of SHE should be driven as far and intimate as possible, without losing focus on the individual SHE issues.

- Because the underlying values for S, H and E are very similar, but for Q in many respects different, the organisation shall consider very carefully all aspects before integrating SHE with Q or with other disciplines. (Again, this recommendation should be read with the definition of Q, used in this Document, in mind.)

So what recommendations could then be given for a successful integration?

- Develop your own integrated management system, based on your own prerequisites, conditions and ambitions. Chose a structure that suits your situation and business. There is no patented solution for everyone. As you probably need to fulfil some legislative requirements on management systems and wish to conform to some external standard, make sure that all the necessary elements of the external systems have been included, but do not try to incorporate their structures in detail.

- Use the activity or process-based approach, for most of the procedures of management system, not the generic approach.

- Especially for an integrated system, it is vital to base the procedures of the management system on activities or processes in the organisation. It is much more difficult (impossible) to work on the generic level (e.g., of ISO 14000).

- You can never go round the fact that you perform a lot of concrete activities (running a machine or a plant, installing a new equipment, maintaining equipment). These activities are the natural base for your management system and the procedures. Then, within such activities the famous loop (of planning, doing, checking, acting) shall be applied. It is most unnatural for most organisations to have *planning, doing checking and acting* as superior and controlling activities in a management system.

- Some generic procedures will also be needed. Examples of such procedures are:

- Organisation and responsibilities;
    - Education and training (general);
    - Document control system;
    - Management review;
    - Non-conformance & corrective action;
    - Records;
    - Auditing procedures;
    - Communication.
- Start with an analysis of the normal activities of the organisation. The activities which are of importance for SHE+Q issues are thereafter regulated in the form of SHE(Q) procedures.

- Do not integrate too much, or you will dilute the essentials of each discipline and you will lose focus on the various subjects.

- S, H and E would normally be OK to integrate "completely". It is possible to have common procedures on almost every issue, activity, etc. A few specific procedures for health only and for environment only will normally have to be produced.

- Be careful with integration between SHE and Q.

- If you want to integrate SHE with Q, consider having only a smaller proportion of procedures as common for all disciplines. They will have to be of a more generic type only (e.g., for document control, goal-setting process, management review, communication), whereas the majority of procedures should have separate SHE procedures and Q procedures.

- Warning for sophisticated, complicated or bureaucratic systems!

- Make it simple (there are too many examples of "proceduralisation" to death)

- The management system must never become a main issue in itself; it is only a tool to facilitate and improve the process of fulfilling the will of the organisation as expressed in the statements of the policy. There are too many examples where the SHEQ manager rules like a sovereign with his/her ISO 9000/14000 system with a lot of attention to formalistic system details, losing focus on the proper main issues.

- Use more training and less procedures in order to approach the behavioural culture.

- Make clear that the responsibility for S, H and E as well as Q is clearly in the line, and has to be headed by the line managers. This will facilitate having integrated systems.

- Make the system flexible, so new legislation or other demands can easily be incorporated.

- Generic issues should be integrated and streamlined as far as possible in common procedures. Procedures specific for a topic, say a health issue, should only deal with this but be written in a format that is standardised for the total management system.

- Avoid the tendency to put too much focus on the procedures as such, both in building/implementing the system and in auditing it. Audits can turn into a hunt for non-compliance with the letter in the procedures and not be a tool for continual improvement, based on the essentials.

- Secure top management commitment (in a true sense; not lip-service, not really meaning what they are saying).

- Secure a broad involvement of the organisation in the development process; the line organisation should be the owner of the product and feel comfortable with it. The system will not survive if its main feature is control by policing; it must be a natural part of the culture.

- A prime mover is needed and should be an internal resource. External consultants may be used for various reasons, but not as focal points.

- Make reference keys to these management systems/standards that are of interest (for potential certification against).

- In order for a management system to survive in the long run, it must be based upon the idea of continual improvement. So there is a need for measurement of performance to demonstrate this. OECD is in the progress of developing "Guidance for Safety Performance Indicators."

ADDENDUM WITH QUESTIONS

The original discussion document had questions which have now been removed in the final document. However they are included here for reference.

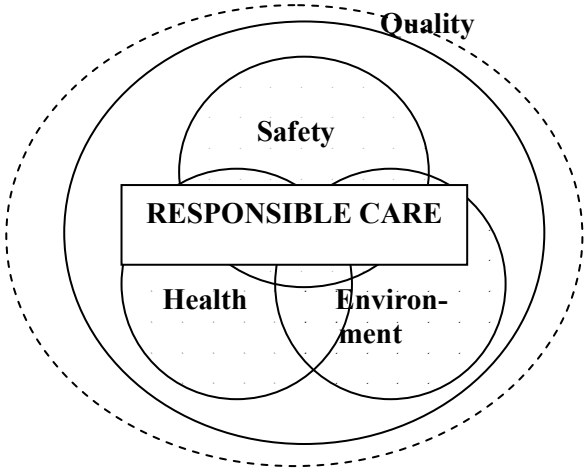
INTEGRATION OR NOT – A PRINCIPAL APPROACH (Chapter 3)

Do you as a participant of the Workshop agree or disagree on the following basic statements?

- Integration of S, H and E should be encouraged – without any hesitation.
- Integration of SHE with Q should be treated with care.
- The Responsible Care concept should preferably be used as an overall governing system.
- Generic issues should be integrated and streamlined as far as possible in common procedures, whereas procedures specific for only one of the disciplines, say a health issue, should only deal with this, but be documented in a standardised way similar for all procedures in the total management system.
- The overriding success factor for a management system – regardless of degree of integration – is the top management commitment and involvement.

Do you have the same or another

View on how the disciplines of SHE and Q interact in the following figure?



Do you agree with the following definitions of Safety, Health and Environment and how they overlap?

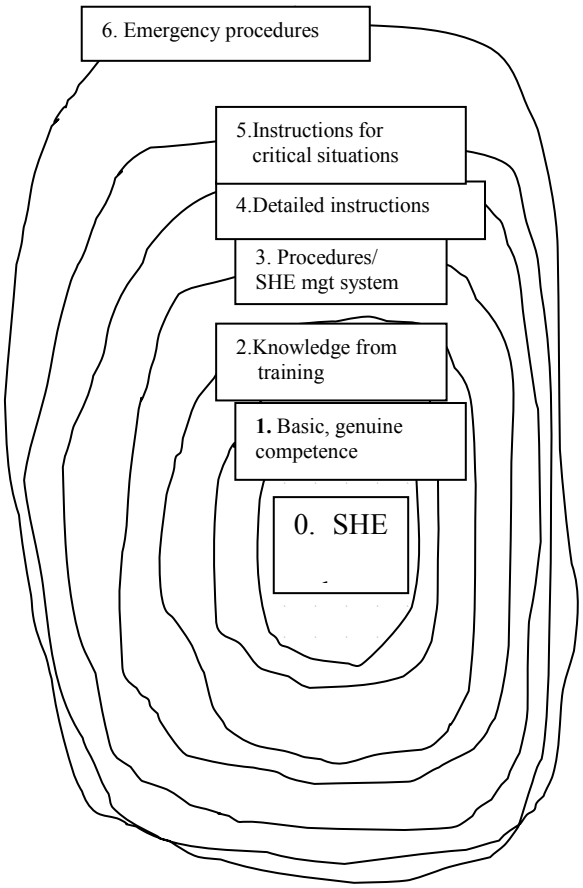
Integration of Safety/Health/Environment					
Health				Environment	
	Safety				
Individual health needs	Work related illnesses	Work accidents	Risk of major accidents	Acute environmental impact	Long-term environmental Impact

DO WE REALLY NEED FORMAL MANAGEMENT SYSTEMS FOR SHE AT ALL? (Chapter 5)

In the text is given a pictorial model for the non-technical management of SHE in an organisation.

What is your picture of how different

"layers of protection" regarding management issues relate to each other?



Based on experience from your organisation, is the above a relevant description of the status of an organisation? What is in your experience the maturity or culture of the various disciplines?

MORE REASONS FOR NEEDING MANAGEMENT SYSTEMS FOR S, H AND E (Chapter 6)

In the text the following reasons are mentioned:

- Poor management is often the root cause of accidents
- Need to explain and make clear norms and principles
- Marketing and regulatory driven requirements
- Increased credibility

Do you see other important reasons for having SHE management systems?

WHAT ARE WE AIMING FOR WHEN INTEGRATING MANAGEMENT OF SAFETY, HEALTH, ENVIRONMENT AND QUALITY? (Chapter 7)

What is your primary interest and driving force in having integrated management systems?

COMMON DRIVERS/DENOMINATORS FOR MANAGING S, H, E AND Q (Chapter 8)

What is your opinion on the drivers for the various disciplines? Are they common for S, H and E and different for Q?

What is the situation regarding legislation of SHE in your case: Does it promote an integrated approach or not?

BENEFITS OF INTEGRATION (Chapter 9)

In the text are mentioned the following benefits:

- Better focus on ownership and accountability
- Enhancement of an holistic view and facilitation of priorities
- Optimum way of resolving conflicting issues
- Common procedures, leading to
  - better clarity
  - less training time
  - less documentation
  - less administration

- reduced auditing
- More flexibility in the system

Are there other important benefits to mention?

IS THERE MONEY TO EARN ON INTEGRATION? (Chapter 10)

The text gives the question an definitive yes as answer.

Besides what is mentioned in the text:

- More efficient administrative system
- Better reliability and more efficient performance of the processes and activities
- More effective project activities
- Better relationship with customers and suppliers.
- Better relationship between employer and employees

Is money or something else the big driver for an integrated approach?

DISADVANTAGES FOR INTEGRATION OF S, H and E (Chapter 11)

The text mentions the following possible disadvantages

- Loss of focus – levelling down
- Unbalanced focus – depending on level of application
- More difficult to satisfy different legislation
- More complex audits

What other disadvantages do you see for the integration of the three disciplines S, H and E?

DISADVANTAGES FOR INTEGRATION OF SHE + Q (Chapter 12)

The text mentions the following possible disadvantages:

Lack of some features in many quality management systems, such as:

- Continual improvement in performance

- Compliance with legislation
- Application to other stakeholders than customers and suppliers (not employees, the community, authorities and the wider environment)
- Considerations to risks, abnormal conditions and emergencies

What is your experience? Do you share the opinion that the Q system tends to dominate the integrated SHEQ management system?

What other disadvantages do you see for the total integration?

INTEGRATION WITH YET OTHER BUSINESS FUNCTIONS? (Chapter 13)

The text mentions the following possibilities:

- Product stewardship
- Security
- Risk management in general

Do you have examples of integration of SHEQ with other disciplines?

OBSTACLES/DIFFICULTIES FOR INTEGRATION (Chapter 14)

The following obstacles are mentioned in the text:

- Different cultures in various disciplines
- Different focuses, objectives and requirements
- Complexity and size of the organisation
- Protection of territory

What is in your experience the major obstacles for integration?

STRUCTURES OF MANAGEMENT SYSTEMS (Chapter 15)

The text mentions two basically different approaches to structure a management system:

- The generic concept
- The activity-based concept

Which of the two concepts for integrated management systems do you prefer?

EXAMPLES OF "OFFICIAL" MANAGEMENT SYSTEMS (Chapter 16)

How do you see the legislative requirements in your country impacting on the way you build management systems?

Does it help or hurt integration to have formal standards for management systems?

RESPONSIBLE CARE AS A COMPREHENSIVE MANAGEMENT SYSTEM (Chapter 17)

How widely used is the Responsible Care concept as a basis for integrated management systems?

MODELS FOR THE INTEGRATION PROCESS (Chapter 19)

In the text is mentioned various models:

- Develop from scratch
- Base on existing systems
- Develop the various sub-systems in isolation and then integrate them.

Which is your preferred approach for the process of integration?

CONCLUSIONS AND RECOMMENDATIONS (Chapter 26)

A large number of conclusions, recommendations and considerations are given.

There are other views and ways on the subject. Bring them up and challenge the statements as given!

ANNEX 2

OECD WORKSHOP ON INTEGRATED MANAGEMENT OF SAFETY, HEALTH, ENVIRONMENT AND QUALITY
Seoul, Korea June 26-29, 2001

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