

State-of-the-art Recognition and Need Analysis;

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1. RISK ANALYSIS

- Respondents were found not to have enough knowledge regarding to risk perspectives and assessments, Material Safety Data Sheet (MSDS), means of hazard pictograms, and legislations of corresponding issues.
- It is important for all who are dealing with chemicals to learn methodological tools and data to evaluate and manage the analysis of risks regarding to major chemical accidents and hazards.

Bernard Martel, Chemical Risk Analysis: A practical Handbook, (2004), ISBN: 978-1-903996-65-2.

2. RISK ASSESSMENT

- Respondents had little knowledge on storage and handling facilities of chemicals, emergency plans to demonstrate all the precautions regarding to the chemicals.
- Risk assessment including control measurements and emergency plans is needed to examine any chemicals that have potential to cause harm and what precautions should be taken to prevent or reduce the risks of chemical accidents.

The safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. WHO human health risk assessment toolkit: chemical hazards (No. 8, 2010)

3. RISK MANAGEMENT

- The majority of the respondents were not able to give correct answer to the questions regarding to Major Accident Prevention Policy (MAPP), Safety report, and details specified in SEVESO III directives.
- Risk management has vital importance for the establishments in order to ensure a safe working conditions at the workplace.
- Risk policies, risk culture, Safety reports, Emergency plans, legislations regarding to major chemical accidents are of great concern for the risk awareness.

M. Da Cruz, S.R. Bentes, The Seveso Directives and Their Application to Enterprise Risk Management, Int. J Latest Trends Fin. Eco. Sc.,3, (3), 2013. Directive 2012/18/EU of 4 July 2012.

4. PREVENTION

- Many of the respondents could not give correct answers to the questions regarding to training intervention team, the chemical and physical effects in an emergency, control of a chemical risk, and principles of prevention.
- Chemical accidents and their hazard to both health and environment are of big deal for the establishments especially for whom dealing with high quantities.
- Consequencies such as the toxicity, corrosive behavior, explosive force, in flammability, radioactivity can be serious for the occupational safety in work place and the environment.
- It is therefore important to evaluate the risks linked to chemical substances, to follow the directives in order to handle them as should be and to establish prevention and intervention measures to prevent or reduce those risks from accelerating.
- Directive 2012/18/EU of 4 July 2012.

5. RESPONSE

- The response to what type of extinguishers in order to quench the burning of metals is not very well known by the respondents.
- The priority should be given to chemical accidents necessarily by proper response actions to prevent harm, or to keep it at affordable levels.
- Emergency plans Article 12(6) Directive 2012/18/EU of 4 July 2012.

6. SAFETY RULES

- Respondents showed a good level of knowledge about general rules about personal hygiene, general procedures in case of an emergency, and requirements that many people from different sectors should know.
- Safety rules should be known by all from the corresponding field in the workplace.
General Chemical Safety Guidelines at <http://blink.ucsd.edu/safety/research-lab/chemical/general/index.html>

7. REGULATIONS

- Some of the questions regarding to REACH, SEVESO, SDS, ADR, and CLP regulations were not answered correctly.
- These regulations play important role in classification, handling, transportation, storage, and emergency act facilities related to chemical substances
Act and regulations <http://www.hsa.ie/eng/Legislation/Acts/>

8. CHEMICAL ACCIDENTS

- The success of the respondents to the questions under this topic was around 44 percent.
- Learning lessons from chemical accidents is important for our future that we hope not to repeat the past in terms of chemical accidents.
http://irgc.org/IMG/pdf/irgc3nov2011_richardgowland.pdf

9. HEALTH

- The average success of the respondents to the questions regarding to chemical alarm sirens, instructions in case evacuation is needed, and instructions for handling and transportation of chemicals, the consequences of chemical accidents were estimated to be low.
- The possible health effects of explosion, fire, toxicity of chemicals are of great concern for public and occupational health.
- Therefore, health is an important and one of the primary topics for both public and establishments who are dealing with chemicals.

10. ENVIRONMENTAL

- There are several points that respondents did not exhibit high success. They are basically about what chemicals causes which side effects on the environment especially for underground waters, and what the possible routes for chemicals polluting the air, earth, and water sources.
- Polluting characteristics of certain establishments using chemicals should be under close control to reduce or prevent leakage or any other risks arising from chemicals dangerous for the ecosystem and the environment.

11. CLASSIFICATION

- Many of the respondents could not answered the questions regarding to the Material Safety Data Sheet (MSDS) and potential harm of chemicals arising from their structural characteristics.
- Classification, Labeling and Packing of Substances and Mixtures (CLP) is cited in SEVESO III directives.

12. PRECAUTION

- Respondents knowledge on taking precaution towards gas leakage, solid chemicals emission routes to the environment and what precautions should be taken into action in case of a chemical accident.
- Accidents in establishments dealing with chemicals have led both the establishments and competent authorities to take more serious precautions in the field. Establishments should inform the authorities periodically following the legislations and regulations to achieve increased safety.
W. Wohlleben and F. Vahrenholt, Precautions against accidents in chemical facilities, Journal of Hazardous Materials 5(1-2), 1981.

13. IMPLEMENTATION

- There is not enough knowledge of the respondents on the transportation of hazardous chemicals on roads (ADR), on rail (RIS), by sea (IMDG) or by air (IATA).
- The data base for the handling, storage and transportation of chemicals are one of the emerging topics for whom dealing with those kind of facilities.
- Implementation of SEVESO Directives and other regulations as an improvement process rather than a compliance focused procedure can serve a significant opportunities for the establishments in their facilities regarding to chemicals.