

State-of-the-art Recognition and Need Analysis

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1. RISK ANALYSIS

- Risk analysis were not very well known by our respondents and open questions not answered
- Risk analysis could be used both for estimation of personal safety and environmental risks (hazards)
- Risk analysis is vital important in chemical industry where hazardous chemicals are involved
- Lessons learnt bulletins on chemical accidents happened have a great importance in prevention and preparedness of chemical accidents

Corrosion-related accidents in petroleum oil refineries

http://www.tukes.fi/Tiedostot/vaaralliset_aineet/ohjeet/mahbbulletin_4.pdf

2. RISK ASSESSMENT

- These questions were not answered, but it's important to know how to assess risks especially in case of hazardous chemicals

Risk Assessment of Chemicals: An Introduction

https://books.google.fi/books?hl=fi&lr=&id=fUZHAAAAQBAJ&oi=fnd&pg=PR7&dq=risk+analysis+tools+for+chemical+accidents&ots=h898lx_Ftz&sig=T_Wq9lc_xu6sG-BFuEQnxRxYK8&redir_esc=y#v=onepage&q&f=false

3. RISK MANAGEMENT

- The idea of MAPP and safety report were well known, but not the details of risk management itself
- It's important to know how to treat and store chemicals safely
- There are lot of chemical legislation on risk management below

Dangerous Chemicals in Industry (including MAPP = Major Accident Prevention Policy)

- http://www.tukes.fi/Tiedostot/englanti/dangerous_goods/brochures/dangerous_chem_brochure.pdf

Seveso directives control major-accident hazards involving dangerous substances, Seveso II Directive

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1997:010:0013:0033:EN:PDF>

Seveso III Directive

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:197:0001:0037:EN:PDF>

4. PREVENTION

- These questions were not answered by our respondents
- These questions are related to tasks of safety persons of industrial plants and rescue services and authorities in charge of safety issues
- These issues should be considered when dealing with industrial chemical hazards

Chemical Accident Prevention & Preparedness

http://www.tukes.fi/Tiedostot/vaaralliset_aineet/ohjeet/mahb-bulletin-no2.pdf

5. RESPONSE

- These two questions were known rather well
- This kind of issues should be part of general knowledge concerning people of all sectors
- Detailed response methods and actions belong to emergency services, see below

Emergency Response Guidebook 2012

<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/ERG2012.pdf>

6. SAFETY RULES

- These questions were not answered by our respondents
- These questions are related to occupational health and should be known by all handling chemicals

LabSafetyRules

http://nobel.scas.bcit.ca/debeck_pt/science/safety.htm

Your steps to chemical safety

http://www.hsa.ie/eng/Publications_and_Forms/Publications/Chemical_and_Hazardous_Substances/Your_Steps_to_Chemical_Safety.pdf

7. REGULATIONS

- These questions were not answered by our respondents
- These questions are related to chemical legislation like Reach, Seveso (see part 3), ADR
- Reach legislation concerns many actors dealing with chemicals, ADR concerns transportation of hazardous chemicals

Reach legislation

<http://echa.europa.eu/regulations/reach/legislation>

ADR (European Agreement concerning the International Carriage of Dangerous Goods by Road)

http://www.unece.org/trans/danger/publi/adr/adr_e.html

8. CHEMICAL ACCIDENTS

- These questions were not answered by our respondents
- Under this title could be described chemical accidents happened and lessons learnt from them

List of industrial disasters

https://en.wikipedia.org/wiki/List_of_industrial_disasters

9. HEALTH

- Only few answers to these questions
- Health issues should be on top priority when handling chemicals, f.ex. occupational threshold limit values should be followed

Permissible Exposure Limits – Annotated Tables

<https://www.osha.gov/dsg/annotated-pels/tablez-1.html>

10. ENVIRONMENTAL

- Typical pollutants of these questions were rather well known
- Even if there are millions of different chemicals, it's only few that causes the most of pollution and they are good to know

Heavy metals in environment

<http://www.icsu.org/future-earth/events/documents/1-3-11-heavy-metals-in-the-environment>

Environmental Pollution, Its Sources and Effects

<http://www.tropical-rainforest-animals.com/Environmental-Pollution.html>

11. CLASSIFICATION

- These questions were not answered by our respondents
- Classification of chemicals is important, because it helps in identification of hazards
- This information can be read also from MSDS
- One commonly used classification happens according to the ADR-system (see part 7)

12. PRECAUTIONS

- These questions were not answered by our respondents
- These questions relate to personal safety and interpretation of chemical properties
- This data is included in MSDS

Personal Protective Equipment

<https://www.osha.gov/Publications/osh3151.html>

13. IMPLEMENTATION

- Only few answers to these questions
- MSDSs or SDSs include all necessary data on chemicals, including safe storage and handling, first aid and response measures both ecological information



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- SDSs include also data on transportation of hazardous chemicals on roads (ADR), on rail (RIS), by sea (IMDG) or by air (IATA)

Safety Data Sheet

http://rigzoneegypt.com/site_pdf/23-112367535067.pdf



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