
Chemical Management Plan in Oil and Gas Industry

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Introduction

Chemicals are ubiquitous in oil and gas industry. The chemicals related accidents are far from rare to occur due to their wide application and complicate nature. It was reported that chemicals are the second leading cause of the US Department of Energy Type A&B accidents¹. Mishandling of the chemicals is a threat to employees, facilities and general public. All chemical exposures may have the potential for, either immediate or chronic, health consequences. It may cause physical damage such as explosion and/or fire accidents. Some chemicals may lead to the equipment deterioration by corrosive reactions. Spillage of the chemicals may result in the environmental disaster. As a consequence of the incidents, the remedial actions is usually time consuming and expensive.

A well designed chemical management plan (CMP) and its effective implementation is vital for a safe working environment, greater productivity and less requirement for costly remedial action in oil and gas industry

Consideration in chemical management plan

1. Integrated safety system

When we discuss the chemical management plan, it should not isolate rather than be integrated into safety management system. All these factors need to be deliberated in the chemical management plan as a part of overall safety management system²:

- a) Scope of the work
- b) Analyse the hazards
- c) Develop and implement hazard controls
- d) Perform the work within controls
- e) Provide feedback and continuous improvement

In this aspect, the interfaces of the chemical management plan with other part of the safety management system are critical for its effective function. The relationship is illustrated in Figure 1.

2. Main elements in the chemical management plan

All these elements have to be considered carefully in a chemical management plan

- a) Hazard Analysis
- b) Acquisition
- c) Inventory And tracking
- d) Transportation
- e) Storage
- f) Control Of chemical hazards
- g) Pollution prevention and waste minimisation
- h) Emergency response
- i) Disposal
- j) Training

¹ DOE Handbook: Chemical Management , US Department of Energy, Washington, DOE-HDBK-1139/1-2000

² Santos EHS Management System Standard: HSHS08, Chemical Management and Dangerous Goods

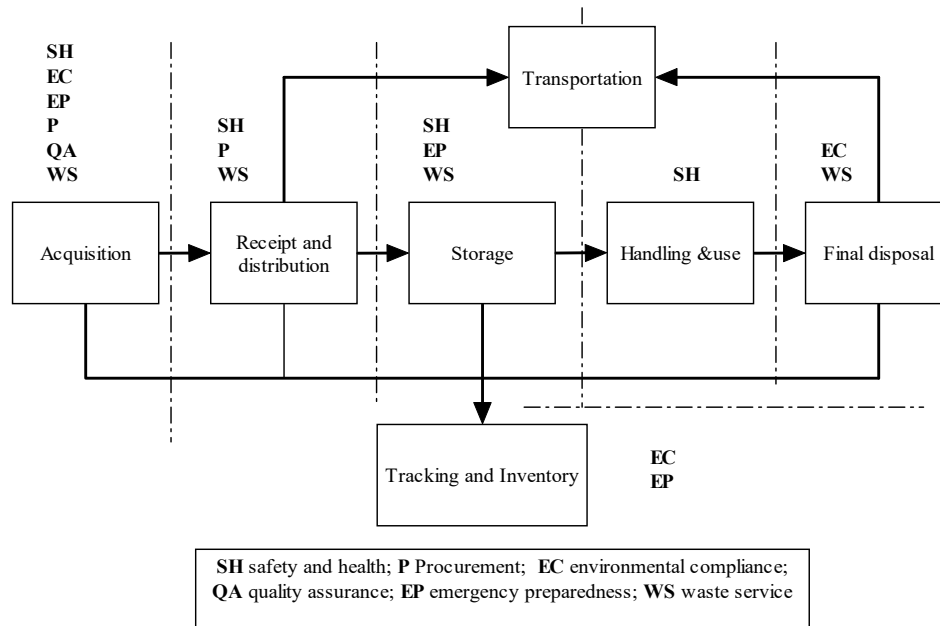


Figure 1 Interface of chemical management plan with safety system³

3. *Essentials in a successful implementation*

a) Communication

Communication is a key for the successful implementation of chemical management. Too many times, I witnessed the failure of the plan by poor communication and misunderstanding. In this sense, most simple solution is also the most effective way. For example, placard, warning signs and readily available hardcopy of MSDS may be more effective for operators in the field.

b) Simple and effective

The good system should be simple and effective. The more complicate system, the more likelihood of mistake. It may lose the direction while trying to cover every angle.

Challenges in chemical management

From field point of view, a real challenge is not on how to write a CMP rather than successfully implementing such plan:

1. *Widely usage of the chemicals*

The chemicals are widely used from drilling, processing, cleaning and testing. Hazardous chemicals could be used by everyone, at everywhere, in anytime, which made it difficult to control and manage.

2. *Variety of the hazardous chemicals*

The complicate nature of the hazardous chemical, such as flammable, combustible, serve negative health effect, shock sensitive, incompatible in storage, needs various controls in place

3. *Broad distribution in the process*

In gas and oil industry, not only process chemicals but also products and intermediate products need to be managed in chemical managing plan since these products and intermediate products are hazardous chemicals as well.

³ CH2M Hill Plateau Remediation Company, PRC-MP-SH-40015 Chemical Management Plan 2009

4. *Site laboratory*

It is often omitted in the plan. However, it uses small amount, large numbers and potent toxic chemicals in its testing activity. It needs to consider carefully in the plan.

Conclusion

Chemical management plan is essential assurance a safe, effective and efficient production. The CMP is an integrated part of overall site safety management plan. A well designed chemical management plan and its

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Xiaoda Xu is a specialist for corrosion and materials engineering with profound knowledge and practical experience in corrosion, production chemistry, cathodic protection and materials engineering. He is a Registered Professional Engineer Queensland (RPEQ) and Chartered Professional (CP) Metallurgy, with AusIMM. With a Ph D in Materials Science; Master in Metallurgical Engineering and Bachelor in Chemistry, he has enthusiastic interest in Corrosion and Asset Integrity. His experience includes corrosion management for major oil and gas upstream companies where he established corrosion management philosophy and roadmap for conventional gas and coal seam gas operation facilities. He has also mapped out detailed corrosion management plan for water and hydrocarbon facilities; He has extensive experience in identifying the corrosion threats, designing corrosion risk assessment tools and implementing monitoring and mitigation strategies for upstream oil and gas corrosion issues.

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Bibliography

¹ DOE Handbook: Chemical Management , US Department of Energy, Washington, DOE-HDBK-1139/1-2000

¹ Santos EHS Management System Standard: HSHS08, Chemical Management and Dangerous Goods

¹ CH2M Hill Plateau Remediation Company, PRC-MP-SH-40015 Chemical Management Plan 2009