

## Chapter 12

# Activities in Oil and Gas Processing for Avoiding or Minimizing Environmental Impacts

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### ABSTRACT

*Formal risk assessments are necessary at various phases of the asset life cycle as they help personnel identify, evaluate, and control hazards that could result in loss of life, injury, pollution, property damage, or business disruption. Hazard evaluations of production development concepts or facility design are well-defined processes, for which much literature is available as guidance. Such evaluations are mandated in some jurisdictions for project regulatory approval. This chapter provides guidance on activities implementation from designing phase, construction phase, operational phase, and decommissioning phase of gathering and processing systems. For each phase, activities that can be implemented to avoid or minimize environmental impact are described, emphasizing the implementation purpose.*

### INTRODUCTION

The operators are dedicated to responsible development of oil and natural gas resources. Responsible development includes good relationships with our neighbors and a commitment to environmental protection and

compliance with all applicable federal, state, and local regulations.

Management leadership and commitment has to be converted into action by the provision of adequate financial and personal resources to ensure that environmental protection measures are incorporated in all operations. Each

DOI: 10.4018/978-1-4666-4777-0.ch012

operating site may need to develop its own specific objectives, and relevant operational targets in line with the company's broader strategic objectives (Rahmawati, 2012). This should be initiated by the site manager, and achieved through a formal communication and consultation process that involves staff, contractors and local stakeholders. The roles, responsibilities, authorities, accountabilities and relationships necessary to implement environmental management must be clearly defined for that site. Line staff in all aspects of operational activity should be assigned specific environmental responsibility and authority within their spheres of control, and must be competent to perform their duties effectively.

### **Activities during the Design Phase**

Designing phase starts by creating a few development solutions and selecting the best one. That process requires integration of engineering, environmental and economic parameters. Environmental forces such as wind, waves, currents, ice, water depth and soil condition have great impact on construction. With platforms and other off shore surface facilities, state of the experience level is important.

The overall basis for designing should be to minimize adverse effects on the environment, consistent with providing an economical means of unit production using safety by design.

Safety by design is a mechanism for moving the discussion of safety hazards and harmful risks into the design and programming phases of construction projects. This involves incorporating hazard analysis and risk assessments during the design phases of construction or renovation of a facility. This

also involves taking the necessary steps to mitigate the risk of incidents that can cause damage to the facility or injuries to workers. Risks are mitigated to an acceptable level and various other aspects such as health and environmental concerns are considered in these early phases of development.

Although it can be easier to identify hazards and environmental impact in an existing facility after construction is complete, it's generally safer and more cost effective to implement appropriate measures before facilities or processes are built. By using this proactive approach to safety and environmental protection, engineering controls are put in place in the early stages of construction, resulting in the mitigation of potentially dangerous or fatal accidents. In the early phases of conceptual design development, several strategies can be employed to recognize potential risks:

- Plans and designs can be compared to similar, existing systems or facilities, taking into account what measures were successful, then parlaying them into the safety program;
- People who have experience with similar, existing systems can be interviewed to determine the successes and challenges they have realized in their safety program;
- Plans can be reviewed by a qualified person, that has an engineering and safety background and is capable of creating designs that ensure compliance with industry safety regulations, standards and owner's requirements;
- Organizations can provide standards or guidelines to consultants and equipment manufacturers prior to building design.

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