



ENVIRONMENTAL WORKSHOP FOR THE OIL AND GAS PROFESSIONAL

BOTTOM LINE

All oil and gas industry professionals that are responsible for the management or maintenance of petroleum facilities from drilling sites to tank batteries must be aware of the multitude of federal laws that govern the environmental aspects of oil and gas drilling and production. There are specific requirements for compliance and beyond that a number of inspection and maintenance steps that can be taken to prevent pollution and damage to the land and expensive remediation.

PROBLEM ADDRESSED

Oil and gas operations are covered under a myriad of federal oil and gas laws. Operators must be aware of what is covered by each and what best practices can be adopted to prevent pollution to the soil, water or air. This workshop introduces the applicable laws and specific steps the operator can take to prevent pollution from happening.

KEY WORDS:

Containment
Discharge
Facility
National Energy Policy Act (NEPA)
Spill Prevention, Control, and Countermeasures (SPCC)
Storage container

TECHNOLOGY OVERVIEW

Introduction

Besides the obvious legal aspect, there are numerous benefits of environmental management. They include better environmental stewardship, reduced cost of waste treatment and disposal, reduced raw materials requirements, improved control of regulatory compliance costs and reduced regulatory burden. A fundamental understanding of the federal laws governing the environmental aspects of petroleum facilities is required as well as of operational steps that should be taken to prevent pollution.

Federal Legislative Overview

The Environmental Policy Act (NEPA) of 1970 established federal environmental policies and goals and the federal agencies to implement NEPA goals and created the Council on Environmental Quality.

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 was passed to define the requirements of cleanup for the release of hazardous substances in the air, water, and land. It provides a list of hazardous substances and the maximum amount that can be spilled before it becomes a Reportable Quantity and contains plans and procedures for responding to oil spills in the navigable waters of the U.S.

Based on a workshop sponsored by PTTC's Eastern Gulf Region in Jackson, Mississippi on May 11, 2006.

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The Superfund Amendments and Reauthorization Act (SARA) of 1986 was intended to develop community emergency plans and disseminate more information to the public regarding hazardous substances. It requires local communities to develop emergency preparedness programs, facilities to provide information about any hazardous substance generated or used by the plant and the plants to exchange information with the community.

The Resource Conservation and Recovery Act (RCRA) of 1976 sets "cradle to grave" controls on hazardous waste during treatment, storage, and disposal processes. It exempts drilling fluid and petroleum products, but does include many of the chemicals used by the industry. It lists the hazardous wastes and requires tracking them from their origin to ultimate disposal.

The Oil Pollution Act of 1990 created the Spill Prevention, Control, and Countermeasures (SPCC) rule. (Go to www.pttc.org/solutions/sol_2005/550.htm for more detailed information on the rule). It requires most onshore facilities to prepare and submit facility response plans and established oil spill reporting requirements.

The Clean Water Act (CWA) of 1977 seeks to eliminate the discharge of pollutants into surface waters and releases of pollutants in toxic amounts.

The Clean Air Act (CAA) of 1977 subjects all pollution sources to air quality regulations and in particular new sources to more stringent regulations. It addresses specific air pollution problems including acid rain, visibility impairments and ozone depletion.

The Endangered Species Act (ESA) of 1973 compels the federal government to require the protection of any land designated as a critical habitat for endangered or threatened species.

Examples in the Oil Field

Drilling Rigs—A common environmental problem with oil and gas drilling operations involves rig wash procedures. While drilling fluids and petroleum-based substances are exempt from RCRA, rig wash fluids are not and must be kept separate and treated as a hazardous waste.

Drilling Fluids and Pits—Ideally the driller will recycle mud systems water and segregate freshwater, saltwater, and oil-based fluids and solids and remove oil as soon as possible to minimize contamination. Some states do not allow pits for use in oil and gas operations.

Pumpjacks—The moving parts make a pumpjack dangerous to people and livestock. Federal regulations require facilities to maintain a certain level of security and the operator should consider fencing the facility. A second potential problem arises from leaking stuffing boxes, spilling oil on the soil around the well. They must be checked regularly and properly maintained.

Tank Batteries—Storage tanks should be properly maintained to prevent leaks through bolts, gaskets, rivets, and seams and particular attention paid to the bottom of the tank. They should be subject to integrity testing every 5 - 10 years and the test records included in the SPCC plans. Flowlines should be regularly repaired or replaced as necessary. Maintenance records should also be included in the SPCC plan. In certain areas nets are required over open top tanks to protect migratory birds.

Separators—Separators and their associated equipment require secondary containment to handle leaks and spills and should be regularly inspected and maintained to minimize leaks and line failures.

Compressors—Compressor stations should be designed to provide for drainage and collection of leaking hydrocarbons. Spills should be collected or wiped, not washed.

Flowlines—A continuously leaking flowline can affect soil to a depth that might require excavation. All above ground pipes should be inspected regularly. Buried pipes should be coated and have cathodic protection. Pumps, valves and gauges are covered under the same regulations as flowlines and similarly must be regularly inspected and maintained.

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Overflow Pits—The CWA contains provisions to prevent the pollution of surface and subsurface water with wastes associated with oil, gas, and brine production. They are strictly regulated as to the design, use, and backfilling. They must be lined. A better alternative for a workover would be skid-mounted pits.

Gathering Lines—Gathering lines are a common source of hydrocarbon pollution. The operator should make sure that catch basins are not overflowing and that the gathering lines are locked and stormwater is removed. Drip pans or other containment and leak detection equipment are recommended.

Spill Response—Secondary containment is required (berms, dikes, curbs, etc.) around oil storage tanks with impermeable material and spills removed as soon as possible. Similarly, salt water must not be continuously released and should also be contained in an impervious structure.

General Operations—Abandoned drums without proper labels have to be treated as hazardous waste by a clean-up crew. Operators should remove and reuse all possible equipment and instigate a system to track chemicals and materials. Chemicals should be labeled and stored properly, with hazardous and non-hazardous chemicals segregated. Operators should also be aware that naturally occurring radioactive material can reach recordable levels on equipment that handles large volumes of liquids and accumulates scale and can be managed with inhibitors. Any asbestos in place as an insulator must be maintained to keep friable asbestos from becoming exposed. It can only be removed by a licensed contractor. General debris must not be allowed to accumulate. Oil and gas wastes exempt under RCRA discarded in a reserve pit can render the entire pit non-exempt hazardous waste. Written procedures and a record of inspections should be done in accordance with the SPCC plan and maintained for a period of three years.

Abandoned Wells—Abandoned wells must be plugged according to a plan. It should minimize the size, with metal sent to a recycler and concrete crushed for use as an aggregate. Abandoned pits must have any spills removed and be properly backfilled.

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The not-for-profit Petroleum Technology Transfer Council is funded primarily by the US Department of Energy's Office of Fossil Energy, with additional funding from universities, state geological surveys, several state governments, and industry donations.

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