Low-Cost Spill Prevention Measures

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Introduction

"Environmental, health and safety responsibility is a core value of Progress Fuels Corporation. Progress Fuels Corporation is committed to excellence in its environmental, health and safety practices and performance, and acknowledges its responsibility to be a good steward of the natural resources entrusted to its management and to provide all employees, contractors and visitors with a safe and healthy workplace. Environmental, health and safety factors will be an integral part of planning, design, construction and operational decisions."[1] The previous excerpt from the recently developed Progress Fuels Corporation Environmental, Health and Safety Policy mirrors parent company Progress Energy's Environmental policy and demonstrates commitment to environmental excellence.

Background

Prior to 2002, the majority of Progress Energy's environmental experience was in dealing with utility generation operations, by far the company's largest subsidiaries. With Progress Fuels Corporations' April 2002 acquisition of Westchester Gas Company (Westchester) and its 215 natural gas-producing wells followed by the February 2003 acquisition of 162 natural gas-producing wells from Republic Energy, Inc. (now Progress Fuels North Texas Gas, Ltd), environmental excellence took on a new meaning…and a new challenge.

[1] Progress Fuels Corporation Environmental Policy Statement, 2003.

Part of the Westchester integration included addressing historical remediation issues. After spending nearly one year and more than $1 million to remediate historical petroleum impacted soils at 194 Westchester oil and gas well sites and conducting similar compliance upgrades and some remedial activities at the Progress Fuels North Texas Gas, Ltd (PFNTG) sites, the natural gas operating entity of these two operations, Winchester Production Company (Winchester), began to investigate preventive measures to help eliminate similar costly future remedial efforts.

Preventive Initiatives

The preventive initiatives identified to date combine the operational know-how of seasoned oil and gas field professionals with the environmental expertise of an operating subsidiary of a Fortune 250 diversified energy company. All physical and administrative changes have been incorporated into daily operations and/or facility start-up with minimal effort.

Administrative Measures

The key administrative measure undertaken by Winchester is the development of an environmental, health and safety management system (EHSMS) that includes the following twelve core elements:

- Environmental Health and Safety Policy
- Significant Environmental Health and Safety Impacts and Risks
- Environmental Health and Safety Performance Objectives and Goals
- Management Review
- Performance Accountability
- Planning and Guidance
- Staffing, Training, and Awareness
- Non-Conformance and Corrective Action
- Audits, Self-Assessments, and Benchmarking
- Recordkeeping and Document Retention

- Communications
- Emergency Response

While still in the beginning stages of implementation, management commitment to the EHSMS and employee involvement in its development and use have led to increased awareness. Employees in the field are beginning to recognize that a small leak at a compressor station or pumping unit can lead to the contamination of soil, surface water, and, potentially, groundwater. Once aware of the potential consequences and liabilities, employees are more likely to take action: either to resolve the identified issue, if possible, or report it for maintenance. Identified issues are tracked to completion using another element of the EHSMS, the corrective action (i.e., non-conformance) list.

In addition to the increased training and meeting time devoted to environmental, health and safety issues, employees are directly involved in identifying environmental aspects and impacts and determining their significance. Significant impacts, such as chemical, petroleum, and saltwater spills, are directly linked to employees' annual incentive goals through an environmental index that sets progressively tougher objectives for environmental performance year after year. In this way, spill accountability (e.g., prevention, response, and reporting) is encouraged through incentive pay.

Contractor Management is another element of the Environmental Health and Safety Management System. Contractors performing work at Winchester facilities are key stakeholders in EHS operations and must ensure the environmental performance and health and safety of Winchester employees as well as their own employees. To this end, Winchester has developed a contractor management program that:

- Considers contractors' past EHS performance during the bidding process and when selecting contractors
- Ensures that applicable EHS requirements are communicated to the contractors and their employees working at Winchester sites
- Periodically evaluates contractors' EHS performance during and at the conclusion of services provided or work performed
- Requires approved contractors to submit a quarterly report format summarizing EHS performance
- Provides spill/release and medical incident notification requirements for all contractors

One of Winchester's major contractors has taken the contractor management program with its focus on environmental responsibility to heart. Since the environmental policy and expectations were introduced less than six months ago, one work over and general maintenance contractor has reported three leaks unrelated to the activities that they were conducting on Winchester properties. The issues were quickly reported to Winchester and, in two cases, they were immediately corrected by the contractor. In all cases, the instances would likely have gone unnoticed until the pumper daily inspections the following day. This same contractor has also started carrying spill containment materials on all company trucks.

By emphasizing environmental expectations with contractors and managing their performance, Winchester hopes to encourage (and reward through long-term contracts and/or master services agreements) environmental accountability and minimize the likelihood and impact of spills and releases.

Another recently implemented EHSMS tool is the self-assessment checklist that targets various environmental indicators at four critical stages of well development (i.e., Well Siting / Pre-construction / Construction, Drilling, Completion, and Turn to Sales). For example, wetlands, proximity to streams and residences, and security are evaluated during the "Well Siting / Pre-construction / Construction" phase and in the "Well Siting / Pre-construction / Construction" section of the checklist. The "Drilling" section of the checklist provides reminders to remove inoperable or abandoned equipment, pipe, tanks, and drums from the property, all of which are potential sources of releases. It also targets contractors, pre-job meetings, and Hazard Communication elements. Many of the items assessed during "Drilling" are also evaluated during "Completion" activities as different contractors and employees are on the site in each stage presenting additional opportunities for spills and releases. Finally, when the well has been "Turned to Sales" and is in a production mode, criteria such as site security, emergency notification, secondary containment, and equipment protection from vehicular traffic are evaluated.

Completed self-assessment checklists are placed in the well operating file while identified issues are assigned to individuals for resolution and are tracked to completion on the corrective action list. While Winchester has not completed an entire year using the self-assessment forms, they are being used to assess environmental conditions and address deficiencies with all new wells. In 2003, the same self-assessment checklist was used to assess sites subject to Spill Prevention Countermeasure and Control (SPCC) requirements. Winchester's intent is to use the checklist for annual self-assessments at all well locations in 2004. This effort is currently under way.

While the self-assessment checklist is used to conduct an initial assessment with new wells and on an annual basis for all wells, pumpers perform more frequent checks. Pumpers have received specific environmental awareness training focused on identifying and either correcting or reporting leaks, cracks, and signs of corrosion on all chemical and petroleum-containing equipment.

An additional preventive administrative measure undertaken in 2003 was the integrity testing of saltwater disposal storage tanks and oil storage tanks located at producing well sites. Winchester recognized that older storage tanks present a potential leak hazard. As such, they developed a listing of all storage tanks and identified the location, construction, size, age, and condition of the tanks. The list was then prioritized based on the criteria affecting integrity and tested using ultrasonic (or other API or ASTM approved, non-destructive testing) methods. Nearly 80 representative tanks were tested for approximately $8,800. The data gathered from this testing allowed Winchester to identify tanks to be removed from service, monitored daily, or deemed acceptable for use. This integrity testing effort will continue in 2004.

One valuable, but less obvious, administrative measure is networking. Winchester representatives participate in a variety of trade associations and industry functions and work to build relationships with regulatory agencies. In 2003, Winchester representatives hosted educational visits from the Texas Commission on Environmental Quality, EPA Region 6, and USEPA Headquarters in Washington, D.C. It has been Winchester's experience that networking, conducting environmental incident investigations following near misses on both internal and external safety and environmental events including spills, and then sharing

identified best practices and "lessons learned," helps Winchester continually improve environmental performance and minimize environmental impacts.

Physical Measures

Many of the above-referenced administrative measures, such as sharing of best practice and using the self-assessment checklist to verify environmental performance and identify deficiencies, have led to the implementation of physical spill prevention techniques.

One easily accomplished measure identified by sharing information across subsidiaries includes equipping storage tank load lines with drip pots and locating the load lines inside containment structures. This common-sense technique can be completed for approximately $400 per load line. Combined with contractor and employee awareness training, this measure has reduced releases to the environment caused by leaking load lines. While saltwater captured in the drip pots must be disposed of, collected oil and condensate can be sold as product. Although the volume of petroleum-based material captured is relatively small when compared with the volume of the storage tank, the dollars earned from sales (approximately $0.70 per gallon, based on market pricing of $30 per barrel) combined with the cost savings from not having to remediate contaminated soil (approximately $50 to $150 per cubic yard of petroleum-contaminated soil depending on disposal method) can be a significant savings over the assets' life in terms of operating and maintenance dollars and during divestiture or retirement.

Once outside a storage tank, secondary containment is the primary line of defense between released material and the surrounding environment. Wells located in populated or pasture

areas are fenced and often employ sectional steel containment structures. Containment structures in more remote areas often employ a gravel bed as the top layer in the secondary containment system to minimize the effects of weathering and impacts on structural integrity. Winchester has compiled the following cost estimates for the various containment options:

Material	Use	Average Quantity	Cost	Comments
<u>Rocked Storage Tank Containment Areas with Fence and Gate (20 ft x 30 ft x 3ft)</u>				
#1 Flexbase Rock	Tank battery floor	23 tons	$122.75	Delivery excluded
#4 Flexbase Rock	Berm base material	23 tons	$ 55.00	Delivery excluded
Screening Rock	Base material cover	23 tons	$ 90.00	Delivery excluded
Backhoe	Containment construction	6 hours at $55 ea	$330.00	
Trucking	Transport materials	3 hours at $70 ea	$210.00	
Gate Panels	Containment area fencing	8 – 10 ft panels at $29 ea	$232.00	
Entrance Gate	Containment area gate	1	$ 42.00	
Metal Walkover	Walkway over berm	1	$350.00	
Labor and Installation		3 men x 2 hrs x $20	$120.00	
		Total	**$1,551.75**	Average Life = 5 yrs
<u>Sectional Steel Storage Tank Containment Areas with Fence and Gate (20 ft x 30 ft x 3ft)</u>				
#1 Flexbase Rock	Tank battery floor	23 tons	$122.75	Delivery excluded
Sectional Steel and 30 mil liner			$4,564.00	Delivery included
Gate Panels	Containment area fencing	8 – 10 ft panels at $29 ea	$232.00	
Entrance Gate	Containment area gate	1	$ 42.00	
Metal Walkover	Walkway over berm	1	$350.00	
Labor and Installation		3 men x 6 hrs x $20	$360.00	
		Total	**$5,670.75**	Estimated Life = 20 + yrs
<u>Clay Storage Tank Containment Areas</u>				
Clay	Berm base material	60 yd^3	$500.00	
Backhoe	Containment construction	4 hours at $55 ea	$220.00	
Labor		2 men x 4 hrs x $20	$160.00	
		Total	**$880.00**	Average Life = 1 yr
<u>Annual Rebuilding Cost for Clay Containment Berms</u>				
Supervisor Labor	Measure and calculate containment volume	0.5 hours at $35 ea	$ 17.50	
Material and Labor			$300.00	
		Total	**$317.50**	

Although all tank containment areas are bermed, Winchester engineers carefully consider sectional steel containment structures or a gravel top layer on earthen berms at each location, particularly those in high-profile and/or high-traffic areas.

Due diligence activities conducted prior to purchasing the Winchester properties identified compressor sites as having among the highest environmental liabilities. As evidence of this, an average of 635 cubic yards of soil was removed at each of five compressor sites during the Westchester site remediation at an average cost of $37,700 per site (inclusive of all labor and equipment, initial and confirmation soil sampling, soil excavation and remediation, landfill disposal, and backfill with clean soil). Given the potential liabilities associated with motors constantly circulating oils and hydraulic fluids, Westchester spent approximately $2,500 on environmental upgrades to retrofit each compressor. The retrofits consisted of installing a collection pan under each compressor that drains to a sump. Collected fluids are recirculated into the fluid reservoirs. To prevent the collection pans from overflowing during rain events, Westchester also constructed roofs over each compressor. These physical modifications combined with preventive maintenance and daily visual observations will yield clear cost savings and environmental benefits.

Conclusion

Through the use of the administrative and physical measures discussed in this paper, Winchester hopes to reduce not only the volume of contaminated soil resulting from normal operations but also the frequency and impact of petroleum-based reportable releases. Our ultimate goal is to “live” our environmental policy and the values best expressed by Progress Energy Chairman William Cavanaugh III in the 2003 Progress Energy Environmental

Report, "At Progress Energy, we take environmental stewardship seriously. It's integrated into how we operate our facilities and conduct business every day as well as how we make major long-term decisions. Acting responsibly toward the environment is a vital part of our overall commitment to customers, investors, employees and neighbors."[2]

[2] "Letter from the Chairman," Progress Energy Environmental Report, 2003.