Assessment of the Potential Costs and Energy Impacts of Spill Prevention, Control, and Countermeasure Requirements for U.S. Petroleum Refineries

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Report Prepared for the

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By

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Executive Summary

The purpose of this paper is to provide an assessment of the potential energy impacts arising from compliance costs required for implementation of the 2002 Spill Prevention, Control and Countermeasures (SPCC) rule at petroleum refineries. This paper estimates that the total capital cost to bring oil refineries into compliance with the 2002 SPCC regulations could range from **$ 379** to **$ 1,570 million.** Secondary containment costs are the largest component of potential SPCC compliance costs, estimated to range from 66 percent to 75 percent of total compliance cost, due to the large number of bulk storage containers, associated valves and piping, and multiple truck and rail loading areas in a refinery. Leak detection and integrity testing contribute an estimated 23 percent to 28 percent of total compliance costs. Compliance costs for SPCC plans, enhanced security measures and employee training are estimated to contribute less than 6 percent of total costs.

Average incremental costs to fully comply with SPCC requirements by the October 2007 deadline are estimated to range from approximately $800,000 to $3.5 million per refinery for small refineries, from $1.2 million to $6.3 million per refinery for medium size refineries, and from $4.9 million to $19.1 million per refinery for large refineries. By several measures, as a percentage of refining sector income or as an overhead cost per barrel of refining capacity, the estimated aggregate SPCC compliance costs for the refining industry are significant. SPCC compliance costs appear likely to disproportionately impact smaller refineries. Some stakeholders have expressed concern that the cumulative impact of SPCC and other regulatory requirements could exacerbate ongoing consolidation in the petroleum refining sector. Refinery industry representatives maintain that while SPCC requirements are unlikely to cause small refineries to shut down, some portion of regulatory compliance costs, including SPCC, are ultimately passed through to the consumer in higher prices for petroleum products.

SPCC Rule Background

The SPCC rule was first promulgated in 1973 and became effective on January 10, 1974.[1] In 1994, the EPA published the Facility Response Plan rule, a related provision that applies to a subset of SPCC-regulated facilities, requiring these facilities to prepare and submit a plan for responding to a worst case discharge of oil or a substantial threat of such a discharge.[2] All refineries are required to have a Facility Response Plan, in addition to complying with SPCC requirements.

The EPA amended the SPCC regulations in July 2002. The 2002 SPCC rule establishes requirements for non-transportation–related facilities with total aboveground oil storage capacity (in tanks or other oil-filled containers) greater than 1,320 gallons, or with buried oil storage tank capacity greater than 42,000 gallons. Regulated facilities are those that can be reasonably expected to discharge oil into the navigable waters of the United States or adjoining shorelines in the event of a spill. Regulated facilities must maintain SPCC response plans, provide SPCC response training for personnel, provide secondary containment for regulated storage tanks and oil-filled containers and conduct regular visual inspection and integrity testing of bulk storage containers. The 2002 SPCC rule revisions became effective August 16, 2002, but EPA subsequently amended the rule in 2002, 2003, 2004 to extend the compliance deadline. On December 12, 2005, EPA proposed further amendments to the July 17, 2002 version of the SPCC rule, and on February 10, 2006, extended the compliance date to October 31, 2007

[1] *(38FR 34164)*

[2] The Facility Response Plan rule applies to facilities that meet at least one of the following criteria: 1) 42,000 gallons or more of oil storage capacity and the facility transfers oil over water to or from vessels, 2) the facility has a million gallons or more of oil storage capacity and lacks secondary containment, 3) a discharge could cause injury to fish, wildlife, sensitive environments, or shut down a public water intake, 4) facility has experienced a reportable spill greater than 10,000 gallons in the past 5 years (40 CFR 112.20).

for facilities to revise and implement their SPCC plans. The reason for the current extension is to provide EPA adequate time to take final action on the proposed December 2005 amendments to the 2002 rule.

From the perspective of the petroleum refining sector, changes in the language of the 2002 SPCC rule expand the scope of the SPCC requirements and bring several types of equipment under the jurisdiction of the rule, beyond the storage tanks originally perceived to be the primary focus of the 1974 requirement. These changes include the inclusion of the word "use" in Section 112.1 and the change in applicability from "tanks" to "containers" that use or store oil and have a maximum capacity of 55 gallons or more. EPA asserts that the 1974 rule was always meant to apply to oil-filled equipment, and that the use of the terms "container" and "use" in the language of the 2002 rule is a clarification of the original intent of the 1974 rule. [3] In addition, the 2002 SPCC rule is perceived as stipulating that the word "should" in the rule really means "shall" or "must," which constrains the range of options for refinery operators and certifying Professional Engineers in meeting the performance-based requirement of the rule to prevent the discharge of oil to navigable waters.

For petroleum refineries, the new refinery components and equipment potentially covered by the 2002 rule include:

- Storage containers for crude oil and finished products. (Under the 2002 rule, certain SPCC requirements such as integrity testing and secondary containment now apply to all bulk storage containers 55 gallons or greater, which represents a new specification beyond the 1974 SPCC requirements for petroleum storage tanks.)
- Associated piping and valves
- Fuel storage containers
- Waste oil and waste water tanks
- Wash racks
- Loading racks and any areas where loading and unloading takes place, provided a loading rack is present (requires secondary containment and overfill protection)
- Crude oil and product pipelines (SPCC covers oil pipelines under EPA jurisdiction, which includes piping within refinery boundaries. The 2002 SPCC rule has raised issues, yet to be resolved, regarding requirements and regulatory jurisdiction for piping outside of containment areas.)
- Fuel and maintenance trucks, mobile refuelers (possibly) and fuel storage tanks

A summary of requirements of the 2002 SPCC rule are provided in Attachment 1. Attachment 2 lists proposed 2005 SPCC rule amendments that potentially impact petroleum terminals.

General Description of the Oil Refining Sector

The U.S. petroleum refining industry consists of 148 refineries (owned by 55 companies) with aggregate crude oil processing capacity of 17.3 million barrels per day.[4] During the six month period from August 2005 through January 2006, total U.S. refinery output ranged from a low of 13.7 million barrels per day (reflecting the aftermath of Hurricane Katrina) to a high of 16.1 million barrels per day.

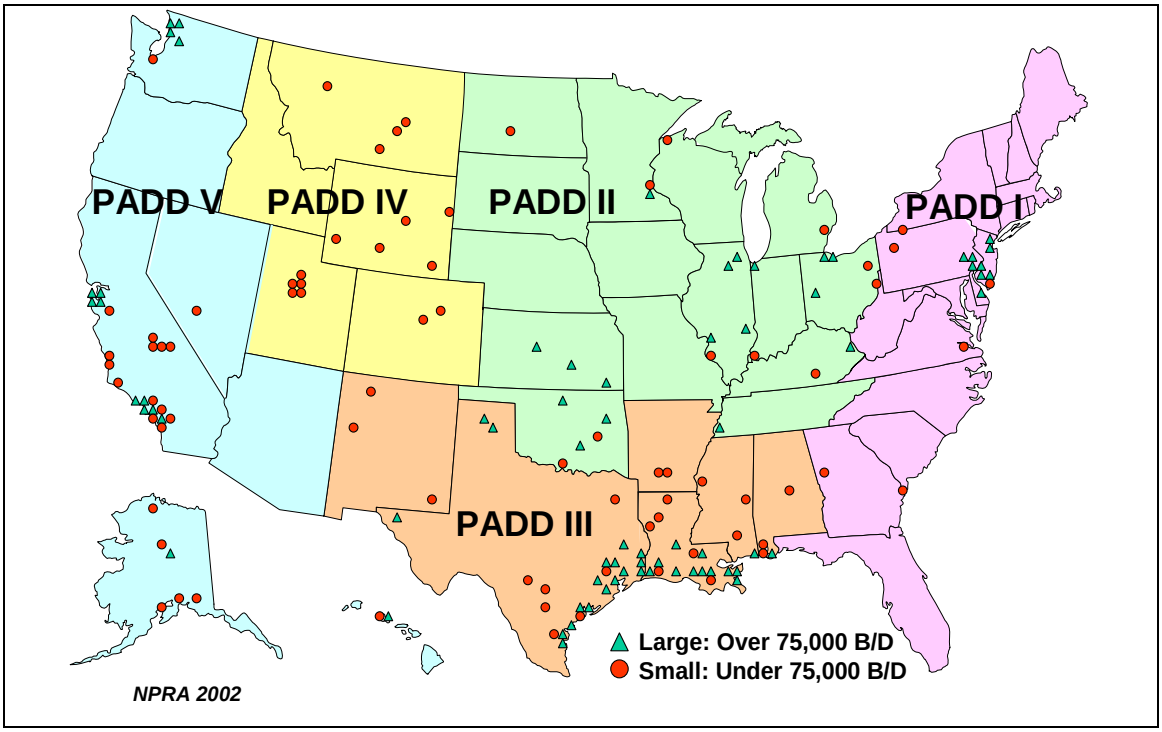
[3] This is evident from "Appendix C, Summary of Revised SPCC Rule Provisions" in EPA's *SPCC Guidance for Regional Inspectors* published November 28, 2005. In the discussion of minimum container size in the 2002 rule (section 112.1 (d) (5) EPA states that in the 1974 rule "…all containers, regardless of size, were considered to be subject to SPCC provisions." Again, in the discussion of oil-filled equipment in the 2002 rule (section 112.2) EPA states that the language in the 2002 rule is a "clarification on the application of the rule to this type of equipment."

[4] U.S. Energy Information Administration, Total Number and Capacity of Operable Petroleum Refineries by PAD and State as of January 1, 2005.

Gasoline accounts for approximately 40 percent of U.S. refinery products. Distillate fuel oil (highway and off road diesel) is the second largest volume refinery product accounting for another 25 percent of products.[5]

The number of U.S. oil refineries has declined by more than half since the 1980's and no new refineries have been built since the 1970's. During the same period, U.S. refining capacity has expanded through process optimization, efficiency improvements and the addition and expansion of operational units. For the past ten years, refinery utilization of operable capacity has typically been above ninety percent, ranging from about 89% to 90% utilization during the winter months to 95% to 97% during the summer months.[6] Figure 1 shows the general location and relative size of U.S. oil refineries.

Figure 1. General Location of U.S. Refineries, 2002



Petroleum refining begins with the distillation, or fractionation, of crude oils into separate hydrocarbon groups. Most distillation products are further converted through cracking, reforming, and other conversion processes. Modern integrated refineries include fractionation, conversion, treatment and blending operations and may include petrochemical processing. Major refinery products include gasoline, kerosene, distillate fuels (diesel), residual fuels, liquefied petroleum gas (propane and butane), coke and asphalt, solvents, petrochemical feedstocks and lubricants. Typical refinery operations require one or more of the following process units:

- Atmospheric Distillation Unit
- Vacuum Distillation Unit (for further distillation following the atmospheric distillation process)

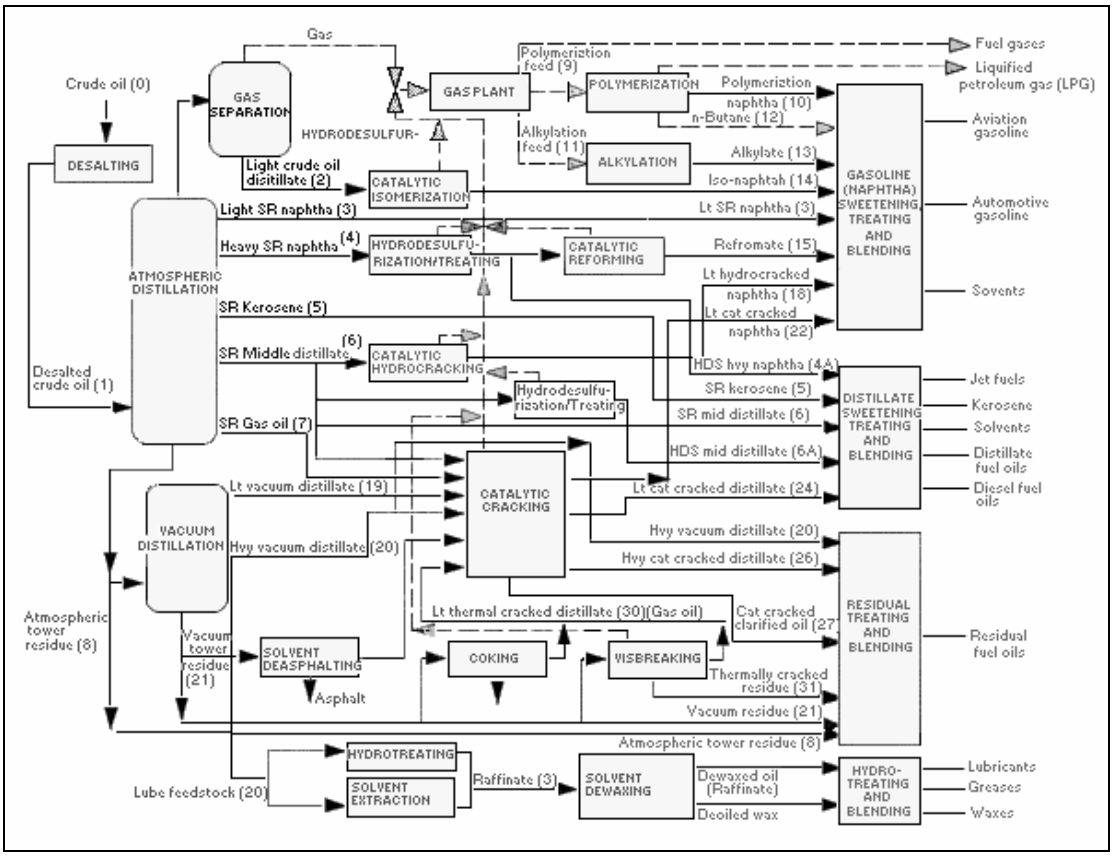
[5] Source: National Petroleum Refiner's Association, www.npra.org and U.S. Energy Information Administration, *Refinery Net Production,* tables, http://www.eia.doe.gov/

[6] Source: U.S. Energy Information Administration, *U.S. Percent Utilization of Refinery Operable Capacity (Percent),* table., http://www.eia.doe.gov/

- Naphtha Hydrotreater Unit
- Catalytic Reformer Unit
- Distillate Hydrotreater Unit
- Fluid Catalytic Cracking and Hydrocracker Units (upgrades heavier fractions into lighter, more valuable products)
- Alkylation Unit; Dimerization Unit; and Isomerization Unit

Figure 2 illustrates the process configuration and products in a typical refinery. Under the 2002 SPCC rule, refinery process units are considered oil-filled manufacturing equipment and are subject to SPCC requirements.

Figure 2. Refinery Process Chart[7]



[7] Source: OSHA Technical Manual Section IV Chapter 2; http://www.osha.gov/dts/osta/

Significant SPCC Compliance Issues for Refineries

The complexity of a facility's SPCC Plan is greatly increased by the 2002 rule, which adds to the cost and time required to complete the plan. The SPCC Plan must include a description of the physical layout of the facility and facility diagram, showing the location and contents of each applicable oil-filled container. The SPCC Plan must note the type of oil in each container and its storage capacity. The SPCC Plan must delineate bulk storage containers, oil-filled manufacturing equipment, and oil-filled operational equipment on the SPCC facility diagram, as well as in the discussion of compliance with inspection requirements of the SPCC rule. These SPCC plan requirements become especially complicated in a refinery because the piping that conveys feedstock or product to and from oil-filled manufacturing equipment is also designated as oil-filled manufacturing equipment, whereas piping not directly associated with process vessels is designated as oil-filled operational equipment.

The greatest paperwork and recordkeeping burdens are associated with the facility diagram and SPCC plan tracking and maintenance for portable containers such as drum storage and for small tanks. Anecdotal reports indicate that it can take a year or more for a complex facility like a refinery or a chemical plant to complete the SPCC plan.[8] The requirement to list each piece of oil-filled operational and manufacturing equipment in the SPCC Plan and on the plan facility diagram is viewed as a substantial burden for large, complex facilities that provides little benefit for spill prevention. A suggested alternative approach is to identify and describe the equipment components comprising a process unit and then locate only the process unit on the facility diagram. Industry stakeholders further recommend that the capacity of oil-filled operational and manufacturing equipment should be based on the working capacity of the equipment, not on the shell capacity or maximum capacity.

The 2002 SPCC rule expands the operational and manufacturing equipment subject to SPCC regulation. Oil refining and storage facilities are explicitly defined in the SPCC rule as non-transportation related facilities under EPA jurisdiction for SPCC requirements. Under the 2002 SPCC rule, requirements for secondary containment and integrity testing apply to all bulk storage containers with capacities of 55 gallons or greater. In effect, this substantially increases the number and types of refinery components that must be included in an SPCC plan and are subject to SPCC requirements. Potentially significant is the inclusion of refinery process vessels, which are defined as oil-filled manufacturing equipment, and equipment that transfers oil in bulk within the confines of the refinery, which can be defined as oil-filled operational or oil-filled manufacturing equipment.

Secondary containment sized to hold the total shell capacities of all the process vessels in a refinery would be a tremendous capital expense. Most operational units already have existing containment that would direct oil releases to collection area, including the use of the process unit sewer and associated wastewater treatment facilities. Furthermore, there may not be enough space to build secondary containment per the 2002 SPCC requirements. Industry comments on the SPCC rule recommend that EPA exempt oil-filled operational and oil-filled manufacturing equipment from the secondary containment requirement to retain the original focus for secondary containment on bulk storage tanks, and to provide the option for oil-filled operational and manufacturing equipment to be covered by an oil spill contingency plan.[9] Other recommendations are for secondary containment specifications to be based on the volume that would likely be released before the leak or spill is identified and actions taken to stop the release, or to be based on the working capacity rather than the shell capacity of the vessel.

[8] For example, BP Decatur, Illinois petrochemical plant, *BP Decatur Environmental Statement for 2004.* SPCC plan was begun in 2004 and not completed until 2005.

[9] American Petroleum Institute Comments to Docket ID No. EPA-HQ-OPA-2005-001, February 10, 2006, regarding *Oil Pollution Prevention; Spill Prevention, Control and Countermeasure Plan Requirements – Amendments; Proposed Rule 70FR73524)* and National Petrochemical and Refiners Association Comments to Docket ID No. EPA-HQ-OPA-2005-001, February 10, 2006.

If adequate secondary containment is not practical, refinery operators must demonstrate technical impracticality and equivalent environmental protection for applicable process units and oil-filled equipment. Industry considers the risk of significant oil discharge from refinery process vessels and oil-filled operational equipment to be low and manageable under existing oil spill response planning. A risk-based approach, rather than reportable discharge history, is recommended as the criterion for determining what oil-filled operational and manufacturing equipment might be exempt from secondary containment requirements.

Integrity testing for all bulk storage containers equal to or greater than 55 gallons capacity. The SPCC Plan must document the secondary containment and conformance with inspection and security requirements for each applicable oil-filled container, or must document how equivalent environmental protection is achieved, if conformance with the secondary containment requirement is impractical. This requirement applied to small tanks and drums is perceived as a significant compliance burden and cost for petroleum refineries because of the large number of containers involved, and the portability of these containers within the facility. The environmental protection provided by this SPPC requirement applied to small tanks and containers is perceived as minimal compared to the compliance cost and SPCC recordkeeping burden; the performance standard of protection of navigable waters can be met by other means such as oil spill contingency measures.

Definition of oil and oil quantity tied to "shell capacity." By defining "oil" to include oil mixtures, whether solid or liquid, and tying the amount of oil to the "shell capacity" of the container, the 2002 SPCC rule apparently expands the number of containers covered by the rule. Based on EPA guidance, which considers the entire shell capacity of a container as "oil" if a release of the contents would cause a sheen on water, a 10,000 gallon water storage tank with a sheen of oil is interpreted as a 10,000 gallon oil storage tank for SPCC purposes. This issue needs further clarification for refineries, as there is uncertainty about whether rough cut tanks and additive tanks are now be covered by the SPCC rule.

SPCC Compliance Schedule. Some refineries may be unable to comply with all aspects of the SPCC rule by the October 2007 deadline, especially if the compliance actions, such as installing secondary containment, require shutting down a process unit. Refineries generally conduct major scheduled maintenance once a year, during which refinery processes are shut down. This maintenance period, called a "turnaround," is typically scheduled in late winter or early spring before refinery production is ramped up for the summer gasoline season. A refinery may be shut down for a month or more depending upon the size of the refinery and the complexity of the scheduled maintenance. Refinery turnarounds are scheduled a year or more in advance, and depending upon the size of the refinery and the type of maintenance operations needed, as much as several hundred million dollars might be budgeted for the turnaround. Some SPCC compliance actions may need to be performed during the refinery maintenance "turnaround" and refineries may need additional flexibility from EPA to delay certain compliance actions until the next scheduled turnaround

Overview of Analytical Considerations for Compliance Cost Analysis

This report is focused on the potential energy implications of SPCC compliance for the oil refining sector, with particular emphasis on the potential capital cost to bring all facilities into compliance with the 2002 SPCC regulation by the current compliance deadline of October 31, 2007. The following sections present the analytical approach and assumptions used to estimate a range of potential capital costs for SPCC compliance. The final section presents the results and considers the potential energy impacts of this capital outlay by the refining sector. Several fundamental considerations must be addressed to estimate compliance costs and the ensuing energy impacts:

- What types of facilities and equipment must comply?

- How many or what portion of facilities are subject to the 2002 SPCC requirements?
- What SPCC requirements apply to each type of facility and what actions must operators take to comply?
- What are the estimated incremental costs associated with compliance including initial compliance costs and recurring or ongoing costs? (*For this analysis, the primary focus is on initial compliance costs.*)

A "high" compliance cost scenario and a "lower" compliance cost scenario were developed, corresponding to high potential impacts and lower potential impact scenarios. Factors that differentiate the cost/ impacts scenarios include the estimated number of facilities needing to comply with the 2002 SPCC rule, the estimated number of tanks and oil-filled equipment at these facilities, and variability in the cost to implement specific requirements of the rule.

General Logic for Estimating Facilities and Equipment Subject to the 2002 SPCC Rule

The 2002 changes to the SPCC rule result in a number of additional facilities or pieces of equipment included under the rule, beyond the storage tanks originally perceived to be the focus of the 1974 rule. However, not all facilities/ equipment will need to take action to comply. For example:

- Some facilities are already in compliance
- Some facilities are located such that they pose no threat to "navigable waters." (Under EPA's current interpretation of "navigable waters", no refineries are assumed to be exempt from SPCC requirements on the basis of location.)[10]
- Some do not meet the size threshold:
    - For facilities that have total storage capacity of less than 10,000 gallons, the operator is allowed to "self-certify" their SPCC plan. (This analysis assumes that no oil refineries have a storage capacity less than 10,000 gallons. Consequently, the self-certification provision of the December 12, 2005 proposed rule-making is assumed to have no effect on the petroleum refining sector.)
    - No individual tank or piece of equipment stores more than 1320 gallons.

Facilities that are not in compliance will need to pursue one or more alternative actions to comply:

- Revise and certify an existing SPCC plan.
- For facilities/ equipment lacking an SPCC plan, some may be incorporated under an existing (revised) SPCC plan and some will require a new SPCC plan.
- Some will build new secondary containment around equipment/ tanks not in compliance.
- For some equipment, secondary containment will be impractical and a spill contingency plan will be substituted. The spill contingency plan includes an inspection and maintenance program for bulk storage containers and associated valves and piping, spill response plan and a written commitment to provide the necessary spill response resources and trained personnel.
- Some facilities will identify and need to address additional gaps in SPCC compliance, which may include cathodic protection or secondary containment of piping; inspections and integrity testing

[10] The June 19, 2006 Supreme Court decision in the joint cases of Rapanos v. United States and Carabell v. U.S. Army Corps of Engineers may change this interpretation, but it is premature at this time to consider the potential impact.

of tanks and oil-filled equipment; leak testing of pipes and valves, enhanced security measures and SPCC training.

Therefore, this analysis estimates that a percentage of oil refineries will incur costs to implement one or more of the following steps before the October 31, 2007 SPCC compliance deadline.

- Revise an existing SPCC plan.
- Develop a new SPCC plan
- Evaluate existing secondary containment to ensure that the containment has sufficient capacity and is sufficiently impervious to contain a leak until cleanup can occur
- Install new or upgrade secondary containment for tanks and oil-filled equipment
- Install new or upgrade secondary containment for loading/ unloading racks
- Install new secondary containment or cathodic protection for valves and piping
- Demonstrate impracticality for secondary containment and substitute a spill contingency plan
- Conduct initial non-destructive integrity testing of aboveground bulk storage containers (After the compliance deadline, periodic testing is required on a regular schedule.)
- Install or upgrade tank overfill protection
- Conduct initial leak testing of piping and valves (After the compliance deadline periodic testing is required on a regular schedule.)
- Upgrade site and equipment security measures
- Provide SPCC training for oil-handling personnel

Estimated Facility and Equipment Count for Oil Refineries

This analysis estimates a facility count for three size categories of oil refineries. The size categories are based on the atmospheric distillation capacity of the refinery in units of barrels per calendar day (bbl/cd). For example, a refinery with a capacity of 100,000 bbl/cd can potentially process 365,000 barrels per year through its atmospheric distillation tower. The amount of crude oil that is actually processed each day while the refinery is operating is generally a larger number referred to as the refinery's capacity per run day. The estimated facility counts for each of the following refinery categories are summarized in Table 1:

- Small refineries (atmospheric distillation capacity of 30,000 bbl/cd or less)
- Medium refineries (atmospheric distillation capacity of 30,001 – 100,000 bbl/cd)
- Large refineries (atmospheric distillation capacity greater than 100,000 bbl/cd)

The number of tanks, oil-filled equipment and loading racks in each refinery category are estimated. These are first order assumptions for the purpose of an initial screening estimate of potential SPCC compliance impacts. More accurate estimates of tanks and oil-filled equipment could be obtained from refinery air quality permits. This approach is time consuming, but could be used to develop accurate equipment counts for a thorough regulatory impacts analysis. Figures 3 and 4 are examples of a small and a large refinery.

Figure 3. Greka Energy, Santa Maria Refinery; Example of a Small Asphalt Refinery

Figure 4. Caltex Refinery; Example of a Large Refinery

Table 1. Estimated SPCC Facility/ Equipment Count for Oil Refineries

Facilities & Equipment	Small Refineries (<=30,000 bbl/cd)	Medium Refineries (30,001 – 100,000 bbl/cd)	Large Refineries (>100,000 bbl/cd)
High Cost Impacts Scenario			
Facilities	37	53	58
Tanks/ Oil-Filled Equipment	100	200	500
Loading/ Unloading Areas	6	8	14
Lower Cost Impacts Scenario			
Facilities	37	53	58
Tanks/ Oil-Filled Equipment	50	100	300
Loading/ Unloading Areas	4	6	10

Bringing Oil Refineries into Compliance

As discussed above, the high and low compliance cost scenarios are differentiated by the number of facilities, tanks and equipment assumed to be brought into compliance, as well as by the estimated costs to implement various requirements of the 2002 SPCC rule. Table 2 summarizes estimated facility and equipment counts and the assumed percentage of facilities needing to comply with at least one requirement of the 2002 SPCC rule. The estimates of facilities and equipment needing to comply with the 2002 SPCC rule are assumptions. There are little data available on compliance costs or the current level of compliance with the 2002 SPCC rule.[11] As real data are obtained from relevant industry stakeholders, assumptions about facility compliance and implementation costs will be updated and the analysis modified.

The assumptions and estimates listed in Table 2 were applied in a spreadsheet to estimate the refineries still needing to comply with various requirements of the 2002 SPCC rule. For example, Table 2 assumes that 95 percent of small refineries stations revise and certify an existing plan and 5 percent require a new SPCC plan. One hundred percent of medium and large refineries are assumed to have existing SPCC plans, which are revised and certified. No refineries are assumed to be exempt from SPCC on the basis of providing no threat to navigable water in the event of a spill. Following is an example of how the assumptions summarized in Table 2 are used in a spreadsheet to estimate the number of facilities and components that must brought into compliance with SPCC requirements:

Example Calculation to Estimate Potential Cost Impact of Bringing Medium Refineries into Compliance for Secondary Containment

Lower Cost Impact Scenario Assumptions:

- 50 percent of medium size refineries need to substantially upgrade or install new secondary containment for 20 percent of regulated tanks or oil-filled process equipment on site; 100 tanks/equipment per refinery assumed for the lower impacts scenario.
- 53 x 0.50 = 27 facilities estimated to need secondary containment
- 27 facilities x 100 tanks/equipment per facility x 0.20 = 540 total tanks/ equipment estimated to need secondary containment installed or upgraded for medium size refineries

[11] One exception is the Maine Department of Environmental Protection which conducted a survey in 2005 of SPCC compliance across multiple industrial and commercial sectors and found 40% percent of facilities surveyed with no SPCC plan.

Table 2. Summary Table of Assumptions for Facility SPCC Compliance at Oil Refineries

Estimated Affected Facilities	Small Refineries (<=30,000 bbl/cd)		Medium Refineries (30,001 – 100,000 bbl/cd)		Large Refineries (>100,000 bbl/cd)	
	Lower Impact	High Impact	Lower Impact	High Impact	Lower Impact	High Impact
No. of Facilities	37	37	53	53	58	58
Average No. of Regulated Tanks and Oil-Filled Equipment per Facility	50	100	100	200	300	500
Average No. of Truck/ Rail Loading/ Unloading Areas per Facility	4	6	6	8	10	14
% Facilities revise existing SPCC plans	95%	95%	100%	100%	100%	100%
% Facilities require new SPCC plans	5%	5%	0%	0%	0%	0%
% Facilities exempt from SPCC requirements	0%	0%	0%	0%	0%	0%
% Tanks & equipment at each facility that receive SPCC installations/ upgrades *(x %)*	30%	30%	20%	20%	20%	20%
% Facilities substitute spill contingency plan for 2nd containment on x% equip.	90%	90%	100%	100%	100%	100%
% Facilities test existing secondary containment for x% of tanks/equipment[12]	50%	60%	50%	60%	50%	60%
% Facilities install new secondary containment for *x%* tanks/equip.	50%	60%	50%	60%	50%	60%
% Facilities install new containment - loading racks	50%	60%	50%	60%	50%	60%
% Facilities install new containment/ cathodic protect for valves/ piping	50%	60%	50%	60%	50%	60%
% Facilities that conduct integrity testing of *x%* tank	50%	60%	50%	60%	50%	60%
% Facilities that install tank overfill prevention at *x%* of tanks	50%	60%	50%	60%	50%	60%
% Facilities conduct leak testing of valves/ piping	50%	60%	50%	60%	50%	60%
% Facilities upgrade site security measures	30%	60%	10%	25%	10%	25%
% Facilities conduct/ upgrade annual SPCC training	50%	60%	50%	60%	50%	60%

[12] Assume 50 – 60% of small refineries evaluate secondary containment for 80% of tanks/equipment; 50-60% of medium refineries evaluate containment for 60% of tanks/ equipment; 50 – 60% large refineries evaluate containment for 50% of tanks/ equipment

High Cost Impact Scenario Assumptions:

- 60 percent of medium size refineries need to substantially upgrade or install new secondary containment for 20 percent of regulated tanks/ oil-filled process equipment on site; 200 tanks/equipment per facility assumed for the high impact scenario
- 53 refineries x 0.60 = 32 facilities estimated to need secondary containment
- 32 facilities x 200 tanks per facility x 0.20 = 1,280 total tanks/ equipment estimated to need secondary containment installed or upgraded for medium size refineries

Once total facilities and oil-filled process equipment needing to comply with current SPCC requirements are estimated, the facility counts are multiplied in a spreadsheet by the estimated cost to implement the various SPCC requirements. Continuing the example above, in the lower impact scenario the cost to install or substantially upgrade secondary containment at a medium size refinery is estimated to be approximately $16,000 per tank/ equipment for half the tanks and equipment, and $50,000 per tank/ equipment for the other half. In the high impact scenario, the cost to install or substantially upgrade secondary containment for tanks and oil-filled process equipment is estimated to be approximately $52,000 per tank/ equipment for half the tanks and equipment, and $50,000 per tank for the other half. The aggregate estimated compliance cost for secondary containment at medium refineries is approximately $17.5 million for the lower impacts scenario. Under the high impact scenario, the aggregate estimated compliance cost for secondary containment at medium refineries is $65 million.

Estimating Incremental SPCC Compliance Costs

Table 3 summarizes estimated incremental costs to implement various components of the SPCC rule. These cost data were garnered from a variety of sources as indicated. Since the focus of this analysis is the cost impact of initial SPCC compliance, the costs in Table 3 are treated as capital costs - initial or "one-time" expenditures to bring a facility into compliance. Refineries will incur several of the cost elements in Table 3 on an on-going basis to maintain SPCC compliance. Future periodic expenditures such as plan updates and inspections and integrity tests will likely be incorporated into a refinery's annual operating and maintenance costs.

Table 4 shows the total estimated SPCC compliance cost components for oil refineries. Table 4 is the output from a spreadsheet analysis that multiplies the estimated facility and equipment counts by the estimated incremental cost for each compliance component. Table 4 shows the total estimated cost to implement each SPCC compliance component, from developing a new SPCC plan to installing secondary containment, to providing enhanced security for oil-filled equipment. The estimated cost for all SPCC compliance components are summed to get a total SPCC compliance cost for each category of facilities in the oil refining sector - small, medium and large refineries. This total is divided by the estimated number of facilities in each category to obtain an estimated average SPCC compliance cost per facility in that category. For example, Table 4 shows that for medium size refineries, the sum of total estimated costs for each component of SPCC compliance is $64 million for the lower impacts scenario and $333 million for the high cost scenario. Dividing these totals by the estimated number of medium refineries (53) gives an estimated average SPCC compliance cost per medium size refinery ranging from $1.2 million (lower cost scenario) to $6.3 million (high cost scenario).

Table 3. Estimated SPCC Compliance Cost Components

Cost Item/Action	Estimated Cost - Low	Estimated Cost - High	Source
Prepare New or Revise Existing SPCC Plan			
Cost for SPCC plan update; small refinery	$10,000	$20,000	Naval Facilities Engineering Service Center, Users Guide for SPCC Regulation, October 2003, UG-2056-Env (NAVFAC Guide); NAVFAC costs scaled up based on refinery industry advisement
Cost for SPCC plan update; –medium refinery	$30,000	$50,000	NAVFAC Guide; refinery industry advisement
Cost for SPCC plan update; large refinery	$50,000	$100,000	NAVFAC Guide; industry advisement
PE certification of existing SPCC plan	$5,000	$10,000	US SBA, Comments to Docket EPA-OPA-2004-0007; Synthetic Organic Chemical Manufacturer's Assoc. Comments to Docket 1/7/2003
Secondary Containment			
Test imperviousness of existing containment	$3,000	$8,000	Ohio Oil and Gas Association , Comments to Docket SPCC-1P-2-58 (12/23/91); costs scaled up based on refinery industry advisement
New Concrete Berm	$15,000	$50,000	NAVFAC Guide; refinery industry advisement
Rollover (Drivable) Berm for Loading/ Unloading Areas (1000 - 5,000 gallons)	$7,500	$50,000	NAVFAC Guide; refinery industry advisement
Cost to retrofit existing containment so it is more impervious to oil	$10,000	$40,000	Ohio Oil and Gas Association , Comments to Docket SPCC-1P-2-58 (12/23/91) ; refinery industry advisement
Containment Area Drains & Sump Pumps	$1000	$2000	NAVFAC Guide; refinery industry advisement
Doorway Spill Barriers	$6,000	$50,000	NAVFAC Guide; refinery industry advisement
Portable Containment Berms	$6,000	$35,000	NAVFAC Guide; refinery industry advisement
Install tank linings, large tanks per site	$50,000	$50,000	Sioux Falls, SD; Williams Energy Partners, LP, 2002 Ann. Rpt., $300,000 (est. 6 tanks @ $50,000 per tank)
Leak Testing, Inspection, Spill Contingency Planning			
Leak Testing of Valves & Piping, per pipe segment	$200	$1,000	NAVFAC Guide
Annual Leak Testing ,Valves & Piping, per facility	$2,000	$20,000	NAVFAC Guide, depends on length of piping system & detection method
Install permanent release detection system for underground pipe systems	$40,000	$1,000,000	NAVFAC Guide, Depends on size of facility
Spill clean up and drain protection systems	$1,000	$5,000	estimate, NAVFAC Guide, Depends on size of spill & complexity of facility, range is $800 - $10,000
Tank Integrity Test, brittle fracture eval., per tank	$10,000	$12,000	NAVFAC Guide, assumes a 20,000 gallon steel AST
Tank Integrity Testing, 1320 gal - 10,000 gal, per tank	$2,500	$5,000	U.S. EPA *Regulatory Analysis for the Proposed Revisions to Oil Pollution Prevention Regulation (40 CFR Part 112),* November 2005 (US EPA, 2005)
Tank Integrity Testing, 10,001 - 42,000 gal, per tank	$10,000	$25,000	US EPA, 2005; industry advisement
Tank Integrity Test., 42,000 - 1,000,000 gal, per tank	$25,000	$50,000	US EPA, 2005; industry advisement
Tank Integrity Testing, >1,000,000, per tank	$50,000	$100,000	US EPA, 2005; industry advisement
Inspection of AST tank bottoms (large AST, 100' dia.)	$30,000	$50,000	M. P.H. Brongers, 2000, *Hazardous Materials Storage,* CC Technologies Laboratories, Inc., Dublin, OH
Replace AST Tank Bottom	$200,000	$500,000	M. P.H. Brongers, 2000, Hazardous Materials Storage, CC Technologies Laboratories, Inc., Dublin, OH
Security and Training			
Valve Lockouts, each	$75	$150	NAVFAC Guide

Fencing, linear foot, includes gates & fence posts	$25	$50	NAVFAC Guide
Install area lighting on poles (1or 2 fixtures per pole), per pole	$4,000	$5,000	NAVFAC Guide
Employee SPCC training	$5,000	$10,000	Estimate for larger facilities
Employee SPCC training	$2,000	$4,000	Estimate for smaller facilities
Overfill Protection			
Overfill Prevention Warning Signs	$150	$150	NAVFAC Guide
Liquid Level Sensing Device	$200	$1,000	NAVFAC Guide, per tank
Liquid Level Sensing Devices w/ Alarms, simple	$5,000	$10,000	NAVFAC Guide, per installation (not per tank)
Liquid Level Sensing, Alarm & Shut Off, fully automated	$20,000	$50,000	NAVFAC Guide, per installation (not per tank)
Corrosion Protection			
Internal lining for 10,000 gallon tank	$48,000	$48,000	M. P.H. Brongers, 2000, *Hazardous Materials Storage,* CC Technologies Laboratories, Inc., Dublin, OH
External coating for 10,000 gallon tank (reapply every 5 years)	$6,000	$6,000	M. P.H. Brongers, 2000, *Hazardous Materials Storage,* CC Technologies Laboratories, Inc., Dublin, OH
Installation of Impressed-Current Cathodic Protection for 100' dia. aboveground tank	$17,000	$17,000	M. P.H. Brongers, 2000, *Hazardous Materials Storage,* CC Technologies Laboratories, Inc., Dublin, OH
Annual Cost of Impressed Current Cathodic Protection (includes depreciation, electric power, annual & bimonthly inspection)	$1,800	$1,800	M. P.H. Brongers, 2000, *Hazardous Materials Storage,* CC Technologies Laboratories, Inc., Dublin, OH

Table 4. Potential SPCC Compliance Cost Components for Oil Refineries – 2002 SPCC Rule

Compliance Action	Petroleum Refineries - "Small"				Petroleum Refineries - "Medium"				Petroleum Refineries - "Large"			
	High Impact		Lower Impact		High Impact		Lower Impact		High Impact		Lower Impact	
	# Facilities	Cost	# Facilities	Cost	# Facilities	Cost	# Facilities	Cost	# Facilities	Cost	# Facilities	Cost
SPCC Plans												
Revise & PE Certify Existing SPCC Plan	35	$ 3,515,000	35	$ 1,757,500	53	$ 10,600,000	53	$ 5,300,000	58	$ 17,400,000	58	$ 11,600,000
Develop New SPCC Plan & PE Certify	2	$ 185,000	2	$ 92,500	0		0		0		0	
Exempt from SPCC due to location	0	$ -	0		0		0		0		0	
Subtotal/ SPCC Plan Estimated Cost	**37**	**$ 3,700,000**	**37**	**$ 1,850,000**	**53**	**$ 10,600,000**	**53**	**$ 5,300,000**	**58**	**$ 17,400,000**	**58**	**$ 11,600,000**
Secondary Containment												
Test Exisiting Secondary Containment	22	$ 5,328,000	19	$ 2,220,000	32	$ 11,448,000	27	$ 4,770,000	35	$ 31,320,000	29	$ 15,660,000
Install New Containment or Upgrade - Tanks & Process Vessels	22	$ 33,966,000	19	$ 9,157,500	32	$ 64,872,000	27	$ 17,490,000	35	$ 177,480,000	29	$ 57,420,000
Spill Contingency Measures Where 2nd Containment is Impractical	33	$ 24,975,000	33	$ 5,994,000	53	$ 131,440,000	53	$ 13,780,000	58	$ 359,600,000	58	$ 45,240,000
Install New Containment or Upgrade - Loading Racks	22	$ 6,926,400	19	$ 629,000	32	$ 13,228,800	27	$ 1,351,500	35	$ 25,334,400	29	$ 2,465,000
Install New Containment or Cathodic Protection - Valves/ Piping	22	$ 11,322,000	19	$ 2,358,750	32	$ 21,624,000	27	$ 4,505,000	35	$ 59,160,000	29	$ 29,580,000
Install New Tank Overfill Protection	22	$ 6,759,900	19	$ 1,429,125	32	$ 12,910,800	27	$ 2,729,500	35	$ 174,000,000	29	$ 34,800,000
Secondary Containment Estimated Cost		**$ 89,277,300**		**$ 21,788,375**		**$ 255,523,600**		**$ 44,626,000**		**$ 826,894,400**		**$ 185,165,000**
Leak & Integrity Test												
Leak Test Valves & Piping	22	$ 444,000	19	$ 185,000	32	$ 636,000	27	$ 265,000	35	$ 1,392,000	29	$ 58,000
Periodic Tank Integrity Test	22	$ 33,300,000	19	$ 6,937,500	32	$ 63,600,000	27	$ 13,250,000	35	$ 261,000,000	29	$ 87,000,000
Leak & Integrity Test Estimated Cost		**$ 33,744,000**		**$ 7,122,500**		**$ 64,236,000**		**$ 13,515,000**		**$ 262,392,000**		**$ 87,058,000**
Security Measures												
Assume 1000' of fencing, 4 lights, 10 valve locks	22	$ 1,587,300	11	$ 463,425								
Assume 2000' of fencing, 8 lights, 20 valve locks					13	$ 1,894,750	5	$ 442,550	15	$ 2,073,500	6	$ 194,300
Annual Employee SPCC Training	22	$ 88,800	19	$ 37,000	32	$ 318,000	27	$ 132,500	35	$ 348,000	29	$ 290,000
Security Measures Estimated Cost		**$ 1,676,100**		**$ 37,000**		**$ 2,212,750**		**$ 575,050**		**$ 2,421,500**		**$ 484,300**
SPCC Compliance - Total Cost		**$128,397,400**		**$ 30,797,875**		**$332,572,350**		**$ 64,016,050**		**$1,109,107,900**		**$284,307,300**
Estimated Average Capital Cost per Facility		**$ 3,470,200**		**$ 832,375**		**$ 6,274,950**		**$ 1,207,850**		**$ 19,122,550**		**$ 4,901,850**

Estimated SPCC Compliance Costs for Petroleum Refineries

The range of SPCC compliance costs estimated for petroleum refineries is summarized in Table 5. The total incremental capital cost to bring the entire oil refining sector into compliance with the 2002 SPCC rule is estimated to range from **$379 million** to **$1,570 million**. The total compliance cost for **small refineries** is estimated to range from **$31 million to $128 million**. For **medium refineries**, the total estimated compliance cost ranges from **$64 million to $333 million**. For **large refineries**, the total estimated cost for SPCC compliance ranges from **$284 million to $1,109 million**. The estimated average compliance costs per refinery are also shown in Table 5.

Table 5. Summary of Estimated Total SPCC Compliance Costs for the Oil Refining Sector (Capital Cost for Implementation by the Compliance Deadline)

	High Cost/ Impact ($ million)	Lower Cost/ Impact ($ million)
Total SPCC Compliance Cost – Oil Refineries	**$ 1,570**	**$ 379**
Small Refineries	$ 128	$ 31
Medium Refineries	$ 333	$ 64
Large Refineries	$ 1,109	$ 284
	($ million)	**($ million)**
Average SPCC Compliance Cost per Refinery ($/site)	**$ 10.6**	**$ 2.6**
Average Cost per Facility – Small Refineries ($/site)	$ 3.5	$ 0.8
Average Cost per Facility – Medium Refineries($/site)	$ 6.3	$ 1.2
Average Cost per Facility – Large Refineries ($/site)	$19.1	$ 4.9

Table 4 provides detailed estimated SPCC compliance costs by SPCC component, showing estimated total costs for SPCC plans, secondary containment, leak and integrity testing and enhanced security for facilities and equipment at oil refineries. Table 6 lists the total SPCC compliance costs for the major categories of SPCC compliance actions: the SPCC plan; secondary containment of tanks and equipment; leak detection; and enhanced security measures. These categories are listed in Table 6 in descending order from potentially the most costly compliance actions for the refineries to the least costly compliance actions:

- Secondary containment and other spill prevention measures
- Leak detection and inspection and integrity testing of bulk storage containers
- SPCC Plan
- Security measures and training

For the high cost scenario, secondary containment and other spill prevention measures are estimated to contribute 75 percent of the total SPCC compliance cost for the oil refining sector. Secondary containment is a large component of potential compliance costs because of the assumed high cost of providing secondary containment for the large number of bulk storage containers and associated valves and piping in a refinery, plus truck and rail loading and unloading areas. Leak detection and inspection and integrity testing contribute 23 percent of total compliance costs. SPCC plans contribute only 2 percent of total compliance cost because nearly all refineries are assumed to have an existing plan. Enhanced security measures and training costs contribute less than 1 percent of total estimated compliance costs; all refineries are assumed to have robust security measures already in place.

For the lower cost scenario, secondary containment is estimated to contribute 66 percent of the total SPCC compliance cost. Leak detection and integrity testing contribute 28 percent of total compliance costs. SPCC plans contribute only 5 percent of total compliance cost. The cost for enhanced security measures is less than 1 percent of total compliance cost.

Table 6. Summary of Estimated Total SPCC Compliance Costs by Compliance Component for Oil Refineries

SPCC Compliance Cost Component	High Cost/ Impact Scenario ($ million)	Lower Cost/ Impact Scenario ($ million)
Secondary Containment		
Total Secondary Containment Cost – All Refineries	**$ 1,171.7**	**$ 251.6**
Small Refineries	$ 89.3	$ 21.8
Medium Refineries	$ 255.5	$ 44.6
Large Refineries	$ 826.9	$ 185.2
Leak Detection, Inspection & Integrity Testing		
Total Leak Detection and Testing Cost – All Refineries	**$ 360.3**	**$ 107.7**
Small Refineries	$ 33.7	$ 7.1
Medium Refineries	$ 64.2	$ 13.5
Large Refineries	$ 262.4	$ 87.1
SPCC Plans		
SPCC Plans, Total Cost – All Refineries	**$ 31.7**	**$ 18.8**
Small Refineries	$ 3.7	$ 1.9
Medium Refineries	$ 10.6	$ 5.3
Large Refineries	$ 17.4	$ 11.6
Enhanced Security, Training		
Total Security, Training Cost – All Refineries	**$ 6.3**	**$ 1.1**
Small Refineries	$ 1.7	$ 0.04
Medium Refineries	$ 2.2	$ 0.6
Large Refineries	$ 2.4	$ 0.5

Sources of Uncertainty in Compliance Cost Analysis

It is important to bear in mind that this compliance cost analysis is an initial "screening" estimate of the potential magnitude of the cost to bring all oil refineries into compliance with the 2002 SPCC requirements, as well as an initial estimate of the potential range of compliance costs that individual facilities might face. There are significant uncertainties throughout especially with regard to the percentage of refineries that are already in compliance, actual compliance costs, and the number of bulk storage containers at individual refineries. This analysis is intended as a starting point for discussion with industry stakeholders, in the hope that new, sector-specific, refinery-specific or company-specific data can be gained, from which the costs and assumptions presented here can be modified to provide the best possible understanding of the cost impacts of the 2002 SPCC rule on the refining sector.

While there is uncertainty around all the inputs to this analysis, key sources of uncertainty include the following:

- Facilities Count and Facilities Characterization – An accurate count of total facilities in the categories of "small", "medium", and "large" is needed.
- Facilities Already in Compliance – The percentage of facilities already in compliance and the percentage that have yet to fully comply with SPCC are major drivers of the results of this analysis. These percentages are assumed.
- Characterization of Tanks and Oil-filled Equipment at Individual Facilities - A better understanding of the numbers of tanks and equipment under SPCC requirements at individual facilities is needed. This is a key driver of the results of the analysis.
- Incremental Compliance Cost – Potential compliance costs have been assembled from a variety of sources, but could be improved. Industry advisement from the petroleum refining and

petroleum terminal and bulk storage sectors have improved the cost estimates by providing ranges of typical and reasonable costs for several SPCC compliance elements, as well as advice used to "scale up" some of the costs obtained from the NAVFAC source.

Potential Energy Impacts of SPCC Compliance for Oil Refineries

This analysis estimates that the total initial cost to bring the U.S. refining industry into compliance with the 2002 SPCC rule by the October 2007 deadline could range from $379 million to $1,570 million. This represents an average cost per refinery (depending on size) that could range from a low of $800,000 for a small refinery under a lower compliance cost scenario to a high of $19.1 million for a large refinery under a high compliance cost scenario. The largest component of the total compliance cost is estimated to be for secondary containment of oil-filled containers 55 gallons or greater in capacity including tanks, piping and process, operational and manufacturing equipment. The large range in potential compliance costs is partly the result of the range in size among refineries. There is a difference of more than two orders of magnitude between the crude oil distillation capacity of the smallest refineries (less than 2,000 barrels per calendar day) and the largest refineries (more than 500,000 barrels per calendar day).[13]

By several measures on a national level, the estimated aggregate SPCC compliance costs for the refining industry are significant:

- For example, the 2002 U.S. Economic Census reports that the total income of the refining industry in 2002 was $17 billion before taxes.[14] Under the high cost impacts scenario, the total estimated SPCC compliance cost of nearly $1.6 billion represents approximately 9 percent of total 2002 refining industry income before taxes. Under the lower cost scenario, the total estimated SPCC compliance cost of $379 million represents approximately 2 percent of total industry income in 2002.
- The estimated total SPCC compliance cost also represents a substantial addition to total industry capital expenditures, equivalent to 5 percent to as much 21 percent of total refining industry capital expenditures in 2002.
- SPCC compliance costs can also be viewed as an additional overhead cost to "own" a barrel of refining capacity. Total U.S. crude oil distillation capacity is currently about 4,688 million barrels per year.[15] Estimated total SPCC compliance costs represent approximately $0.33 per barrel of national crude distillation capacity under the high cost scenario and approximately $0.08 per barrel of crude distillation capacity under the lower cost scenario.

These estimated aggregate cost impacts might be greater for small to medium size refineries. For example, potential SPCC compliance costs might represent a larger share of capital expenditures or income for smaller refineries.

The potential for SPCC compliance costs to disproportionately impact small operators can be illustrated by the estimated costs shown in Table 5. The estimated average capital cost to bring small refineries into compliance ranges from $800,000 to $3.5 million per facility. If a typical crude oil distillation capacity for small refineries is assumed to be 15,000 bbl/cd, then the estimated SPCC compliance cost can be represented as a range from $0.15 to $0.64 per barrel of capacity under the low and high cost scenarios. If a typical distillation capacity for medium refineries is assumed to be 65,000 bbl/cd and the average per facility compliance costs are those in Table 5, then the estimated SPCC compliance cost represents a range from $0.05 per barrel of capacity to $0.27 per barrel of capacity under the low and high cost scenarios. If a

[13] Source: U.S. Energy Information Administration. For example, the crude oil distillation capacity of the Foreland Refining Corp. refinery in Eagle Springs, NV is 1,707 bbl/cd, compared to the ExxonMobil Baytown, TX refinery with a distillation capacity of 557,000 bbl/cd.

[14] The value of refinery products shipped was approximately $195 billion. Subtracting total cost of materials of $168 billion (for crude oil and other refinery raw materials), total capital expenditures of $7.4 billion and total production worker wages of $2.6 billion gives a total industry income of approximately $17 billion before taxes. Source: 2002 U.S. Economic Census of Petroleum Refineries, published December 2004

[15] U.S. Energy Information Administration

typical capacity for large refineries is assumed to be 250,000 bbl/cd, then the estimated SPCC compliance costs of $4.9 million to $19.1 million represent a range from $0.05 per barrel of capacity in the lower cost scenario to $0.21 per barrel of capacity under the high cost scenario.

Some public comments regarding the 2002 SPCC rule and the proposed 2005 amendments express stakeholder concern that regionally or locally significant energy impacts could arise from the impact of incremental SPCC compliance costs on small refineries. The apparent concern is that the cost of SPCC compliance might lead to the closing of small local refineries and exacerbate an on-going trend of consolidation in the refining sector. The refining industry maintains that SPCC compliance costs alone will not to lead to the closure of small refineries.[16] The most likely energy impact of the SPCC rule is that initial costs to comply with the rule and subsequent costs to maintain SPCC compliance become part of the overhead cost for the refinery to provide a barrel of refining capacity. All refineries are subject to increasingly stringent environmental regulation of their operations, especially air emissions, in addition to costs incurred to meet increasingly stringent environmental specifications for petroleum fuels. SPCC compliance costs contribute to the cumulative cost of regulatory compliance borne by the refining industry. Ultimately, these costs are passed through to refinery customers and consumers of petroleum products in the form of higher prices, and on a national scale, the SPCC compliance component seems likely to be on the order of a fraction of a cent per gallon.

[16] National Petrochemical and Refiners Association, personal communication to Robin Petrusak, Advanced Resources International, August 2006.

List of Attachments

Attachment 1.

Key Features of the 2002 SPCC Rule of Relevance to Oil Refineries

The 2002 SPCC rule expands both the scope and requirements of the original 1974 SPCC rule, which has generated considerable confusion and controversy as a result. The implementation of the final rule is now pushed forward to October 31, 2007, more than five years beyond the original implementation date of August 16, 2002. This section briefly describes key features of the 2002 SPCC rule that are likely to be relevant to oil and gas pipelines.

The universe of oil-filled vessels covered by SPCC requirements has expanded to include small tanks, drums and oil-filled equipment.

- The 2002 SPCC requirements apply to "containers" that "use" or store oil and have a maximum or 'shell' capacity of 55 gallons or more.
- Oil-filled operational and manufacturing equipment are now included, in addition to petroleum storage tanks, which were the primary focus of the 1974 rule. Newly regulated oil-filled "containers" include process vessels, gathering lines, sumps, pipelines, tank trucks, oil-filled "motive" power equipment, and non-motive oil-filled equipment such as compressors, oil-water separators, and electrical transformers and tank trucks. Containers less than 55 gallons are exempt from SPCC requirements.
- Exempt containers include:
    - Containers that use or store oil having a shell capacity less than 55 gallons
    - Storage tanks and containers used exclusively for wastewater treatment
    - Completely buried storage tanks and associated piping with less than 42,000 gallons capacity and loading racks associated with exempt underground storage tanks
    - Permanently-closed aboveground storage tanks
    - Pressurized piping, gathering lines, tanks and other facilities and equipment that are "in-line" (not pressure –isolated) with the operating pressure of the main pipeline, and are already regulated by the Department of Interior, the Department of Transportation, or the U.S. Coast Guard

Spill reporting, SPCC Plans and training requirements

- The review frequency of SPCC Plans is extended from 3 to 5 years and SPCC Plans can be integrated with emergency plans or use non-standard formats.
- The SPCC Plan must be amended whenever there is a change in the facility that "materially affects the facility's potential for the discharge of oil into or upon the navigable waters of the United States…" Examples of a material change include the commissioning or decommissioning of new storage tanks, pumps and booster stations.
- The 2002 SPCC Plan requirements are more detailed and comprehensive, requiring detailed facility drawings; the location and description of all oil-filled containers; oil handling/emergency procedures; discussion of SPCC compliance for each subject container or an explanation of equivalent environmental protection; waste disposal options; and emergency notification list, etc. Historical spill information is no longer required in the SPCC Plan.
- Training is required for "oil-handling personnel" only and must include "discharge briefings" at least once a year.

Secondary Containment and Integrity Testing and/or Inspection of Bulk Storage Containers and Associated Piping and Valves

- Sized secondary containment such as liners, dikes, berms, and curbing are required for all oil-filled vessels that contain 55 or more gallons of oil. This includes process equipment and piping, loading racks, pumps, process tanks, separators and engine crankcases, as well as storage tanks.
- The secondary containment must be "sufficiently impervious" to contain the oil until it can be cleaned up.
- Secondary containment can be waived on the basis of technical impracticality, but not because of economic cost, and must be replaced with a spill contingency plan plus periodic integrity testing and/or inspection.
    - Integrity testing must combine visual inspections with another nondestructive test method
- New buried piping must be coated, wrapped and provided with cathodic protection.

Requirements for bulk storage containers and loading/ unloading racks

- Secondary containment must be provided for loading racks sufficient to hold the maximum compartment capacity of any tank car or tank truck.
- Locks, warning system or alarms must be provided to prevent overfilling of tanks or disconnection of the oil transfer lines at loading/ unloading racks.
- Secondary containment or an alternative drainage catchment system must be provided for all bulk storage tanks sufficient to hold the capacity of the tank plus precipitation.
- Regular visual inspection and non-destructive testing of aboveground storage tanks must be conducted.
- Regular leak tests are required for regulated buried tanks and associated pipelines, plus cathodic protection and coatings for buried tanks.
- Storage tanks must be retrofitted where necessary with high liquid level alarms and pump "cut off" devices.

Security

- Facilities must be fenced, lighted and locked or guarded to prevent oil spills resulting from vandalism.
- Various switch guards, covers and locks are required for oil-filled operational and manufacturing equipment such as pumps, pipe valves and for the valves of emergency drainage/ discharge systems.

Definition of Facility and Clarification of Regulatory Jurisdictions

- The 2002 SPCC Rule provides clarification of the applicability of SPCC requirements including definitions of a "facility" and the universe of "non-transportation-related" facilities.
- The 2002 SPCC rule further describes the different jurisdictions of federal agencies for regulating oil-filled equipment and containers.
- EPA's definition of "navigable waters of the US" remains the subject of pending litigation.

Attachment 2.

Proposed 2005 SPCC Rule Amendments that Potentially Impact Refineries

EPA proposed the December 2005 SPCC rule amendments to reduce the compliance burden on small facilities and to address other concerns raised by stakeholders. It is not apparent that the proposed 2005 SPCC rule amendments offer significant regulatory compliance relief for petroleum refineries, although EPA confirmed that refinery process vessels were not to be treated as bulk storage containers under the SPCC.

2005 SPCC Rule amendments reduce compliance requirements for qualified small facilities.

- This amendment is intended to provide relief to small facilities such as smaller farms, small commercial enterprises and marginal oil and gas wells.
- This amendment allows owner-operators of a qualified facility to self-certify the facility's SPCC plan rather than require certification by a licensed Professional Engineer.
- Aggregate facility storage capacity must be 10,000 gallons or less. The facility must have no reportable discharges during the ten years prior to self-certification or since becoming subject to SPCC requirements.
- Self-certified SPCC plans for qualified facilities are permitted some flexibility in meeting facility security requirements and integrity testing of bulk storage containers, such as relying on visual inspection alone or industry-standards for steel tank integrity testing.

Alternatives to sized secondary containment for oil-filled operational equipment.

- This amendment offers an alternative to secondary containment requirements for qualified oil-filled operational equipment. The alternative approach substitutes an oil-spill contingency plan and a written commitment of manpower, equipment and materials needed to contain and clean up an oil discharge.
- The alternative oil spill contingency plan does not require the facility to first receive an impracticality determination for secondary containment.
- Facilities can exercise this alternative if there have been no discharges from oil-filled operational equipment in the preceding 10 years or since becoming subject to SPCC regulations.

Alternative to integrity testing for shop-fabricated tanks with capacity less than 30,000 gallons.

- The 2002 SPCC rule requires regularly scheduled visual inspection and integrity testing of aboveground tanks. The proposed amendment does not require integrity testing for shop-fabricated tanks of 30,000 gallons or less provided all four sides of the tank are visible and can be visually inspected. The amendment may offer some relief refineries if the SPCC-regulated tanks meet the size and configuration requirements.
- Tanks that have a synthetic liner on the bottom do not require integrity testing even if the tank is not elevated off the ground.
- Tanks that rest on bare ground continue to be of concern for corrosion and leakage and will require integrity testing.