

Table 1. Annual Respondent Burden and Cost - NESHAP for Petroleum Refineries (40 CFR Pa

| Burden item | (A) | (B) | (C) | (D) |
|--|-----------------------------|--|--|-----------------------------------|
| | Person-hours per occurrence | No. of occurrences per respondent per year | Person-hours per respondent per year (C=AxB) | Respondents per year ^a |
| 1. Applications | N/A | | | |
| 2. Survey and studies | N/A | | | |
| 3. Acquisition, installation, and utilization of technology and systems ^c | | | | |
| Technical | 32 | 1 | 32 | 0 |
| Management | 2 | 1 | 2 | 0 |
| 4. Reporting requirements | | | | |
| A. Read and understand rule requirements ^{d, e} | | | | |
| <u>Initial:</u> | | | | |
| i. General/applicability | 20 | 0.1 | 2 | 142 |
| ii. Storage vessels | 20 | 0.9 | 18 | 142 |
| iii. Process units – LDAR | 20 | 1.1 | 22 | 142 |
| iv. Process vents | 20 | 0.9 | 18 | 142 |
| <u>Periodic:</u> | | | | |
| i. General/applicability | 4 | 1 | 4 | 142 |
| ii. Storage vessels | 1 | 9 | 9 | 142 |
| iii. Process units – LDAR | 2 | 11 | 22 | 142 |
| iv. Process vents | 2 | 9 | 18 | 142 |
| v. Heat exchange systems | 2 | 3 | 6 | 142 |
| B. Required activities ^{d, e} | | | | |
| <u>Initial:</u> | | | | |
| i. General/applicability | 10 | 0.1 | 1 | 142 |
| ii. Storage vessels | 88 | 0.9 | 79.2 | 142 |
| iii. Process units – LDAR | 8 | 1.1 | 8.8 | 142 |
| iv. Process vents – initial performance test ^f | 11 | 0.4 | 4.4 | 142 |
| v. Process vents – repeat performance test ^f | 11 | 0.4 | 4.4 | 71 |
| <u>Periodic:</u> | | | | |
| i. General/applicability | 3 | 1 | 3 | 142 |
| ii. Storage vessels | 4 | 9 | 36 | 142 |
| iii. Process units – LDAR | 1 | 11 | 11 | 142 |
| iv. Process vents | 2 | 9 | 18 | 142 |
| v. Heat exchange systems – sampling analysis ^g | | | | |
| Technical | 1 | 36 | 36 | 142 |
| Plant operator | 3 | 36 | 108 | 142 |
| vi. Heat exchange systems – triggered monitoring of leak ^h | | | | |

| | | | | |
|--|-----------------------------------|-----|------|-----|
| Technical | 1 | 2 | 2 | 142 |
| Plant operator | 3 | 2 | 6 | 142 |
| vii. Heat exchange systems – leak repair ⁱ | 40 | 2 | 80 | 142 |
| C. Create information | See 4B | | | |
| D. Gather existing information | See 4B | | | |
| E. Write report ^{d,e} | | | | |
| Startup, shutdown, and malfunction plan | 40 | 1 | 40 | 0 |
| Notification of compliance status ^j | | | | |
| i. Storage vessels | 1 | 0.9 | 0.9 | 142 |
| ii. Process units – LDAR | 4 | 1.1 | 4.4 | 142 |
| iii. Process vents | 1 | 0.9 | 0.9 | 142 |
| iv. Heat exchange systems | 1 | 0.3 | 0.3 | 142 |
| Notification of storage vessel inspections | 1 | 0.9 | 0.9 | 142 |
| Notification of reconstruction – process vent control devices ^f | 4 | 0.4 | 1.6 | 142 |
| Notification of performance tests ^{d,e} | See 4B | | | |
| Startup, shutdown, and malfunction reports | See semiannual compliance reports | | | |
| Semiannual compliance reports ^{k,l} | | | | |
| i. General/applicability ^m | 18 | 2 | 36 | 142 |
| ii. Storage vessels ⁿ | 1 | 18 | 18 | 142 |
| iii. Storage vessels – seal gap failure ^o | 3 | 2 | 6 | 142 |
| iv. Process units – LDAR ^p | 3 | 22 | 66 | 142 |
| v. Process vents ^q | 1.5 | 8 | 12 | 142 |
| vi. Heat exchange systems ^r | 2 | 6 | 12 | 142 |
| Reporting Subtotal | | | | |
| 5. Recordkeeping requirements | | | | |
| A. Read and understand rule requirements | See 4A | | | |
| B. Plan activities ^{d,e} | See 4A | | | |
| C. Implement activities ^{d,e} | See 4B | | | |
| D. Develop record system ^s | | | | |
| <u>Initial:</u> | | | | |
| i. Storage vessels | 2 | 0.9 | 1.8 | 142 |
| ii. Process units – LDAR | 75 | 1.1 | 82.5 | 142 |
| iii. Process vents | 2 | 0.9 | 1.8 | 142 |
| <u>Periodic:</u> | | | | |
| i. Storage vessels | 2 | 9 | 18 | 142 |
| ii. Process units – LDAR | 75 | 11 | 825 | 142 |
| iii. Process vents | 2 | 9 | 18 | 142 |
| iv. Heat exchange systems ^t | | | | |
| Technical | 12 | 12 | 144 | 142 |
| Plant operator | 12 | 12 | 144 | 142 |
| E. Time to enter and transmit information | | | | |
| <u>Initial:</u> | | | | |
| i. Storage vessels | 6 | 0.9 | 5.4 | 142 |

| | | | | |
|--|-----|-----|-------|-----|
| ii. Process units – LDAR | 99 | 1.1 | 108.9 | 142 |
| iii. Process vents | 12 | 0.4 | 4.8 | 142 |
| <u>Periodic:</u> ^u | | | | |
| i. Storage vessels | 3.5 | 9 | 31.5 | 142 |
| ii. Process units – LDAR | 99 | 11 | 1089 | 142 |
| iii. Process vents | 29 | 4 | 116 | 142 |
| iv. Heat exchange systems | 1 | 3 | 3 | 142 |
| F. Time to train personnel ^v | | | | |
| <u>Initial:</u> | | | | |
| i. Storage vessels | 1 | 0.9 | 0.9 | 142 |
| ii. Process units – LDAR | 1 | 1.1 | 1.1 | 142 |
| iii. Process vents | 1 | 0.4 | 0.4 | 142 |
| <u>Periodic:</u> | | | | |
| i. Storage vessels | N/A | | | |
| ii. Process units – LDAR | 0.5 | 11 | 5.5 | 142 |
| iii. Process vents | 1 | 4 | 4 | 142 |
| iv. Heat exchange systems ^w | 2 | 10 | 20 | 142 |
| Recordkeeping subtotal | | | | |
| TOTAL LABOR BURDEN AND COST (Rounded)^x | | | | |
| Annualized cost of capital ^y | | | | |
| Operation and maintenance (O&M) ^{x,z} | | | | |
| TOTAL ANNUAL COST (Labor, Annualized Capital, O&M) ^x | | | | |

Assumptions:

a. We estimate there are 142 existing petroleum refineries in the U.S. subject to NESHAP subpart CC, based on recent Agency data. We estimate that no new refineries will become subject to this regulation. Furthermore, we estimate that a refinery has the following affected equipment: 1.1 process units, 0.9 process vents, and 0.3 heat exchange systems subject to a monthly sampling program for VOC levels with the program.

b. This ICR uses the following labor rates: \$112.01 per hour for technical labor; \$64.74 per hour for installation, maintenance, and managerial labor; and \$43.47 per hour for clerical labor. These rates are from the United States Department of Labor, Bureau of Economic Analysis, "Estimates" for NAICS code 324100 - Petroleum and Coal Products Manufacturing. The rates have been increased by 110 percent to reflect inflation.

c. The labor estimates are based on an EPA Maximum Achievable Control Technology (MACT) floor cost analysis, which estimates 2 labor hours for management.

d. We assume that initial notifications and periodic reporting requirements for existing sources are accounted for in other rule requirements. This ICR only addresses the additional industry burden associated with rule requirements for the compliance period.

e. We assume that all existing respondents have complied with initial monitoring, recordkeeping, and reporting requirements for storage vessels; LDAR initial requirements; initial performance testing for process vents routed to a control device for each unit. Respondents having reconstructed units, however, must comply with initial requirements. We estimate 1.1 process units, 0.9 process vents, and 0.3 heat exchange systems per refinery).

f. We assume that 4 process vents per refinery are routed to control devices, and of which existing refineries will reconstruct.

g. We assume all heat exchange systems at existing refineries are in compliance with the heat exchange system monitoring requirements. We estimate the labor burden for setup of portable air stripping column and sampling/analysis for one heat exchange system per refinery, and that the event occurs 12 times per system per year, for a total of 36 occurrences per refinery.

- h. We assume 2 events per year at each refinery, and estimate the labor burden for additional sampling and analysis triggered by these events to be 40 hours per refinery per year.
- i. We assume 2 events per year at each refinery, and estimate the labor burden to be 40 hours per repair.
- j. New and existing refineries must submit notifications of compliance status for new or reconstructed units affected by the rule.
- k. The rule requires that sources meet specific periodic requirements including: monitoring of storage vessels annually, LEL monitoring of process vents, and monitoring results, and submittal of periodic semiannual compliance reports addressing each affected facility.
- l. Notifications related to construction/reconstruction and to periodic reporting for existing sources are accounted for in other sections of the rule.
- m. We assume 18 labor hours per occurrence, and that there will be 2 occurrences per refinery per year.
- n. We assume 1 labor hour per occurrence, and that there will be 18 occurrences per respondent per year (9 storage vessels).
- o. We assume 3 labor hours per occurrence, and that there will be 2 occurrences per refinery per year.
- p. We assume 3 labor hours per occurrence, and that there will be 22 occurrences per respondent per year (11 process units).
- q. We assume 1.5 labor hours per occurrence, and that there will be 8 occurrences per respondent per year (4 process vents).
- r. We assume 2 labor hours per occurrence, and that there will be 6 occurrences per respondent per year (3 heat exchange systems).
- s. We assume sources already have record systems in place to monitor existing operations. The burden shown below reflects the additional burden for recordkeeping requirements for new affected facilities.
- t. We assume 12 occurrences per respondent per year and 24 labor hours per occurrence for recordkeeping requirements as plant operators.
- u. We have included the labor associated with recording and transmitting data to develop initial and semiannual reports. We assume 1 hour per occurrence for equipment leaks at each of the 11 process units, 29 hours at each of the 4 process vents routed to control devices, and 1 hour for each heat exchange system.
- v. We assume existing sources will provide initial training to employees associated with new affected facilities, and that the burden for training is included in the burden for new affected facilities.
- w. We assume annual training for heat exchange system requirements will require 2 labor hours per operator, and assume that the burden for training is included in the burden for new affected facilities.
- x. Totals have been rounded to 3 significant figures. Figures may not add exactly due to rounding.
- y. We assume that no new refineries will become subject to this regulation. New refineries will need to purchase and install a stripping column apparatus, for sample collection. For each refinery, we estimate the total cost to be \$116,870, assuming a capital cost of \$100,000 for the stripping column apparatus and \$16,870 for the labor and other costs associated with other affected units.
- z. The O&M cost assumes one mid-point calibration of sampling equipment prior to each sampling event. For each refinery, we assume 1 mid-point calibration per year, and 3 heat exchange systems per refinery.

N/A – Not Applicable

rt 63, Subpart CC) (Renewal)

112.01 64.74 66.49 139.63 43.47

| (E) | (F) | (G) | (H) | (I) | (J) |
|---|---|--|---|--|----------------------|
| Technical person-hours per year (E=CxD) | Installation, maintenance, and repair person-hours per year (F=CxD) | Plant operator person-hours per year (G=CxD) | Management person-hours per year (Ex0.05) | Clerical person hours per year (Ex0.1) | Cost ^b \$ |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | N/A | N/A | 0 | 0 | \$0.00 |
| 0 | N/A | N/A | 0 | 0 | \$0.00 |
| | | | | | |
| | | | | | |
| | | | | | |
| 284 | N/A | N/A | 14.2 | 28.4 | \$35,028.13 |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| 3124 | N/A | N/A | 156.2 | 312.4 | \$385,309.47 |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| | | | | | |
| 568 | N/A | N/A | 28.4 | 56.8 | \$70,056.27 |
| 1278 | N/A | N/A | 63.9 | 127.8 | \$157,626.60 |
| 3124 | N/A | N/A | 156.2 | 312.4 | \$385,309.47 |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| 852 | N/A | N/A | 42.6 | 85.2 | \$105,084.40 |
| | | | | | |
| | | | | | |
| 142 | N/A | N/A | 7.1 | 14.2 | \$17,514.07 |
| 11246.4 | N/A | N/A | 562.32 | 1124.64 | \$1,387,114.11 |
| 1249.6 | N/A | N/A | 62.48 | 124.96 | \$154,123.79 |
| 624.8 | N/A | N/A | 31.24 | 62.48 | \$77,061.89 |
| 312.4 | N/A | N/A | 15.62 | 31.24 | \$38,530.95 |
| | | | | | |
| 426 | N/A | N/A | 21.3 | 42.6 | \$52,542.20 |
| 5112 | N/A | N/A | 255.6 | 511.2 | \$630,506.41 |
| 1562 | N/A | N/A | 78.1 | 156.2 | \$192,654.74 |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| | | | | | |
| 5112 | N/A | N/A | N/A | N/A | \$572,595.12 |
| N/A | N/A | 15336 | N/A | N/A | \$1,019,690.64 |
| | | | | | |

| | | | | | |
|-------|-------|-----|-------|-------|--------------|
| 284 | N/A | N/A | N/A | N/A | \$31,810.84 |
| N/A | N/A | 852 | N/A | N/A | \$56,649.48 |
| N/A | 11360 | N/A | N/A | N/A | \$735,446.40 |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | N/A | N/A | 0 | 0 | \$0.00 |
| | | | | | |
| 127.8 | N/A | N/A | 6.39 | 12.78 | \$15,762.66 |
| 624.8 | N/A | N/A | 31.24 | 62.48 | \$77,061.89 |
| 127.8 | N/A | N/A | 6.39 | 12.78 | \$15,762.66 |
| 42.6 | N/A | N/A | 2.13 | 4.26 | \$5,254.22 |
| 127.8 | N/A | N/A | 6.39 | 12.78 | \$15,762.66 |
| 227.2 | N/A | N/A | 11.36 | 22.72 | \$28,022.51 |
| | | | | | |

| | | | | | |
|----------------|-----|-------|--------|--------|------------------------|
| | | | | | |
| 5112 | N/A | N/A | 255.6 | 511.2 | \$630,506.41 |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| 852 | N/A | N/A | 42.6 | 85.2 | \$105,084.40 |
| 9372 | N/A | N/A | 468.6 | 937.2 | \$1,155,928.42 |
| 1704 | N/A | N/A | 85.2 | 170.4 | \$210,168.80 |
| 1704 | N/A | N/A | 85.2 | 170.4 | \$210,168.80 |
| 105,057 | | | | | \$10,150,404.47 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 255.6 | N/A | N/A | 12.78 | 25.56 | \$31,525.32 |
| 11715 | N/A | N/A | 585.75 | 1171.5 | \$1,444,910.53 |
| 255.6 | N/A | N/A | 12.78 | 25.56 | \$31,525.32 |
| | | | | | |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| 117150 | N/A | N/A | 5857.5 | 11715 | \$14,449,105.28 |
| 2556 | N/A | N/A | 127.8 | 255.6 | \$315,253.21 |
| | | | | | |
| 20448 | N/A | N/A | N/A | N/A | \$2,290,380.48 |
| N/A | N/A | 20448 | N/A | N/A | \$1,359,587.52 |
| | | | | | |
| | | | | | |
| 766.8 | N/A | N/A | 38.34 | 76.68 | \$94,575.96 |

| | | | | | |
|----------------|-----|-----|--------|---------|---------------------|
| 15463.8 | N/A | N/A | 773.19 | 1546.38 | \$1,907,281.90 |
| 681.6 | N/A | N/A | 34.08 | 68.16 | \$84,067.52 |
| | | | | | |
| 4473 | N/A | N/A | 223.65 | 447.3 | \$551,693.11 |
| 154638 | N/A | N/A | 7731.9 | 15463.8 | \$19,072,818.96 |
| 16472 | N/A | N/A | 823.6 | 1647.2 | \$2,031,631.77 |
| 426 | N/A | N/A | 21.3 | 42.6 | \$52,542.20 |
| | | | | | |
| | | | | | |
| 127.8 | N/A | N/A | 6.39 | 12.78 | \$15,762.66 |
| 156.2 | N/A | N/A | 7.81 | 15.62 | \$19,265.47 |
| 56.8 | N/A | N/A | 2.84 | 5.68 | \$7,005.63 |
| | | | | | |
| | | | | | |
| 781 | N/A | N/A | 39.05 | 78.1 | \$96,327.37 |
| 568 | N/A | N/A | 28.4 | 56.8 | \$70,056.27 |
| 2840 | N/A | N/A | 142 | 284 | \$350,281.34 |
| 422,626 | | | | | \$44,590,851 |
| 528,000 | | | | | \$54,700,000 |
| | | | | | \$0 |
| | | | | | \$143,000 |
| | | | | | \$54,800,000 |

ency data gathered through an ICR collection request under Section 114 of the CAA. We assume that d units: 9 storage vessels; 11 process units subject to LDAR provisions; 9 process vents requiring ak detection and repair, as well as recordkeeping and reporting requirements to ensure compliance

nce, and repair; \$66.49 per hour for plant operators; \$139.63 per hour for executive, administrative, Bureau of Labor Statistics, "May 2014 National Industry-Specific Occupational Employment Wage percent to account for the benefit packages available to those employed by private industry.

1 estimates the planning burden for a single heat exchange system to be 32 hours for technical labor

existing NSPS and NESHAP regulations for equipment leaks, wastewater, storage tanks, and heat reports.

nts for existing units, including initial notifications; design analysis and establishment of operating l device; heat exchanger requirements; and development of startup and malfunction plans and record ate that existing refineries will reconstruct 10 percent of their existing units (i.e., 0.9 storage vessels,

ict 10 percent. Also, we assume that 50 percent of respondents will repeat performance tests.

; requirements promulgated in the 2009 rule amendment, but would need to meet the periodic xchange system to be 1 hour for technical labor and 3 labor hours for an operator. We assume there es per refinery per year.

ed by leak monitoring to be 1 hour for technical labor and 3 labor hours for an operator.

e standard.

LDAR monitoring of process units daily, monthly monitoring of process vents, recording of process
ty and performance test result.

er existing NSPS and NESHAP regulations for equipment leaks, wastewater, storage tanks, and heat

/refinery x 2 occurrences/storage vessel/year).

s/refinery x 2 occurrences/process unit/year).

; routed to control devices/refinery x 2 occurrences/process vent/year).

systems/refinery x 2 occurrences/heat exchange system/year).

cts reconstructed units affected by the standard.

sociated with heat exchange systems. The labor hours are divided equally between technical and

We assume it takes respondents approximately 3.5 hours at each of the 9 storage vessels, 99 hours for
ir at each of the 3 heat exchange systems.

ere will be periodic refresher trainings.

there are 10 operators per facility.

all LDAR equipment for heat exchange systems, including an FID analyzer and a portable air
i capital discount rate of 7 percent, annual interest over 10 years, and that there will be no other

ry, we assume 0.25 technical labor hours per sampling event, 12 sampling events per refinery per

Table 2. Average Annual EPA Burden and Cost -NESHAP for Petroleum Refineries (40 CFR Pa

| Activity | (A) | (B) | (C) | (D) |
|--|---------------------------------|---------------------------------------|---|------------------------------|
| | EPA person-hours per occurrence | No. of occurrences per plant per year | EPA person-hours per plant per year (C=AxB) | Plants per year ^a |
| 1. Initial notifications ^c | | | | |
| Notification of reconstruction – process vents ^d | 1 | 0.4 | 0.4 | 142 |
| Notification of compliance status – storage vessels ^e | 1 | 0.9 | 0.9 | 142 |
| Notification of compliance status – equipment leaks ^e | 1 | 1.1 | 1.1 | 142 |
| Notification of compliance status – process vents ^e | 1 | 0.9 | 0.9 | 142 |
| Notification of compliance status – heat exchange systems | 2 | 0.3 | 0.6 | 142 |
| Notification of performance test – process vent control devices ^e | 1 | 0.4 | 0.4 | 142 |
| Notification of storage vessel inspections | 1 | 0.9 | 0.9 | 142 |
| 2. Periodic reports ^f | | | | |
| Review of startup, shutdown, malfunction reports | N/A | | | |
| Semiannual parameter exceedance reports | 4 | 2 | 8 | 142 |
| Annual tank inspection failure reports | 4 | 1 | 4 | 142 |
| Semiannual compliance – LDAR reports | 10 | 2 | 20 | 142 |
| Semiannual compliance – heat exchange system reports | 1 | 2 | 2 | 142 |
| TOTAL LABOR BURDEN AND COST (Rounded) ^g | | | | |

Assumptions:

a. We estimate there are 142 existing petroleum refineries, and that no new refineries will become subject to the rule over the following affected units: 9 storage vessels; 11 process units subject to LDAR provisions; 9 process vents for requiring n subject to a monthly sampling program for VOC leak detection and repair, as well as recordkeeping and reporting requirem

b. Costs are based on the following labor rates: managerial rate of \$62.90 (GS-13, Step 5, \$39.31 + 60%), technical rate of Step 3, \$15.78 + 60%). These rates are from the Office of Personnel Management (OPM) "2014 General Schedule," which

c. We assume that all existing respondents have complied with initial monitoring, recordkeeping and reporting requirement establishment of operating parameters for storage vessels, LDAR initial requirements, initial performance testing for proce development of startup and malfunction plans and record systems for each unit. Respondents having reconstructed units, h refineries will reconstruct 10 percent of their existing units (i.e., 0.9 storage vessels, 1.1 process units, 0.9 process vents, and

d. The notification of reconstruction is only required for process vents routed to control devices. We assume that 4 process refineries will reconstruct 10 percent.

e. The notification of compliance status includes performance test results, as required by the general provisions.

f. The rule requires that respondents submit semiannual compliance reports addressing each affected unit subject to the rule

g. Totals have been rounded to 3 significant figures. Figures may not add exactly due to rounding.

N/A – Not Applicable

Part 63, Subpart CC) (Renewal)

46.67 62.9 25.25

| (E) | (F) | (G) | (H) |
|---|---|--|----------------------|
| Technical person-hours per year (E=CxD) | Management person-hours per year (Ex0.05) | Clerical person-hours per year (Ex0.1) | Cost ^b \$ |
| 56.8 | 2.84 | 5.68 | \$2,972.91 |
| 127.8 | 6.39 | 12.78 | \$6,689.05 |
| 156.2 | 7.81 | 15.62 | \$8,175.51 |
| 127.8 | 6.39 | 12.78 | \$6,689.05 |
| 85.2 | 4.26 | 8.52 | \$4,459.37 |
| 56.8 | 2.84 | 5.68 | \$2,972.91 |
| 127.8 | 6.39 | 12.78 | \$6,689.05 |
| | | | |
| | | | |
| 1136 | 56.8 | 113.6 | \$59,458.24 |
| 568 | 28.4 | 56.8 | \$29,729.12 |
| 2840 | 142 | 284 | \$148,645.60 |
| 284 | 14.2 | 28.4 | \$14,864.56 |
| 6,400 | | | \$291,000 |

the 3-year period of this ICR. We have further assumed that a refinery has monitoring, recordkeeping, and reporting; and 3 heat exchange systems to ensure compliance with the program.

\$46.67 (GS-12, Step 1, \$29.17 + 60%), and clerical rate of \$25.25 (GS-6, excludes locality rates of pay.

ts for existing units, including: initial notifications; the design analysis and ss vents routed to a control device; heat exchanger requirements, and owever, must comply with initial requirements. We estimate that existing d 0.3 heat exchange systems per refinery).

; vents per refinery are routed to control devices, and of which existing

