US Environmental Protection Agency
Office of Enforcement and Compliance Assurance (OECA)

Appendix VI – Leak Detection and Repair Penalty Policy

September 2012

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Part I: General

A. Overview and Applicability

Appendix VI of the Stationary Source Civil Penalty Policy (General Policy) provides guidance on how to calculate settlement penalties for violations of the equipment leak standards that EPA has promulgated in 40 C.F.R. Parts 60, 61, and 63. EPA first added Appendix VI to the General Policy on March 3, 1988, because penalties for violations of equipment leak standards had to take into account different factors than are described in the General Policy. At that time, Appendix VI applied only to cases under Part 61. Since then, EPA revised the General Policy and, as required by the Clean Air Act Amendments of 1990, issued numerous equipment leak standards in 40 C.F.R. Part 63 for various source categories of Hazardous Air Pollutants (HAPs).

With this revision, EPA is taking the opportunity to modify Appendix VI to reflect experience gained since 1988 in enforcing equipment leak standards, to cover violations not previously covered, and to explicitly expand Appendix VI's applicability to Parts 60 and 63. While the specific equipment covered, the leak repair thresholds, and other such matters may vary between Parts 60, 61, and 63, the fundamental structure of the equipment leak standards in all three of these Parts is similar. This similarity enables this Appendix to be used for all equipment leak standards in Parts 60, 61, and 63.

B. Scope

The General Policy provides guidance for assessing penalties for administrative and civil judicial enforcement actions under the Clean Air Act. Under the General Policy, penalties are assessed, in part, in accordance with the gravity of the violation and also the economic benefit of non-compliance. Appendix VI does not address the economic benefit component of penalty calculations, and economic benefit, if any, should be calculated in accordance with the General Policy.

The gravity component of a penalty has four parts: (1) a penalty amount for actual or possible harm; (2) a penalty amount for the importance to the regulatory scheme; (3) a penalty amount for size of the violator; and, (4) adjusting the gravity component. This appendix to the General Policy provides the methods for calculating the first two of the four parts of the gravity component: (1) actual or possible harm; and, (2) importance to the regulatory scheme. The penalty calculations provided in this Appendix account for the unique nature of the regulations pertaining to equipment leaks of non-HAP VOCs and HAPs. The third and fourth parts of the gravity component, i.e., size of violator and adjusting the gravity component, as well as the economic benefit of non-compliance, are calculated according to the General Policy.

As of the date of this Appendix, the penalty amounts already take into consideration the inflation adjustments required by 40 C.F.R. Part 19 (Adjustment of Civil Penalties for Inflation) and the Debt Collection Improvement Act of 1996. To the extent that additional adjustments for inflation are required after the date of this appendix, and the violations in the matter occurred after that time, then the amounts in this appendix must be adjusted accordingly.

C. Categories of LDAR Violations

This appendix covers the following types of violations associated with the equipment leak regulations:

1. Recordkeeping violations;
2. Reporting violations;
3. Failure to identify equipment (including misidentifying equipment) subject to regulation;
4. Inspection and Method 21 monitoring violations;
5. Failure to tag leaking equipment for repair;
6. Failure to repair leaks on time or at all;
7. Equipment standard violations, e.g., failure to cap open-ended lines;
8. Pressure testing violations.

D. Adjustment Multipliers

The actual or potential harm to the environment from violations of the emissions-related regulations identified in Categories 3 through 8, above are more severe if the predominant fugitive emissions are HAPs rather than non-hazardous volatile organic compounds (non-HAP VOCs), and for non-HAP VOCs, if the facility is located in an ozone non-attainment area rather than an ozone attainment area. The actual or potential harm is also more severe if the violations present a significant risk to communities. Accordingly, there is an upward adjustment to the penalty calculations in this appendix to reflect the greater severity of these emissions-related violations. Table 1 provides the multiplier that is applied to the penalties calculated for the above-referenced violations to account for the differences in severity.

TABLE 1. MULTIPLIERS FOR EMISSIONS-RELATED VIOLATIONS

Predominant Fugitive Emissions	Ozone Attainment Status	Penalty Multiplier for Violations Other than Recordkeeping and Reporting
Non-HAP VOCS	Attainment	1
Non-HAP VOCs	Non-attainment	2
HAPs	Attainment or non-attainment	2
HAPs risk to communities	Attainment or non-attainment	2 plus an upward multiplier when warranted

If the violations include some process units where the predominant fugitive emissions are HAPs (40 C.F.R. Parts 61 or 63 apply) and some process units where the predominant fugitive emissions are non-HAP VOCs (40 C.F.R. Part 60 applies), then the penalties under this appendix should be calculated separately, if possible, between the HAP process units and the non-HAP process units. As an alternative, if it is not possible to separate the HAP and non-HAP process units, then the case team may use its discretion to apply a single multiplier between 1 and 2 to the final penalty calculated under this Appendix.

The appropriate multiplier(s) is to be used when calculating the penalties under this appendix. The multiplier(s) is not to be used after calculating the final CAA penalty in the case, which may also include economic benefit, size of violator, and adjustments to the gravity component.

PART II: PENALTY ASSESSMENT

For explanatory purposes, this appendix refers to the requirements of 40 C.F.R. 63 Subpart H, National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks, and other regulations. References to specific regulations are not to be construed as limiting the scope of this Appendix.

A. Recordkeeping Violations

Recordkeeping requirements ensure that the regulations are enforceable. Penalties for recordkeeping violations are assessed in the range of $250 to $37,500. A complete failure to keep records should generally be assessed a penalty in the upper end of the range; another example of a violation for which higher penalties are assessed includes (but is not limited to) listing unregulated equipment on an equipment list, because listing such unregulated equipment can bias the calculated leak rate low. Penalties in the upper range are particularly appropriate where the failure to keep records adversely affects other regulatory requirements, e.g., missing visual inspection records, which could indicate that the facility did not perform the visual inspections.

Incomplete records can generally be assessed lower penalties, provided that the objective of the recordkeeping requirement is still served. The case team may use its discretion in determining an appropriate penalty adjustment as the nature and circumstances of the violation(s) requires. Lower range penalties may be assessed for violations such as; the omission of a very small percentage of equipment from an equipment list; for each entry required by 40 C.F.R. § 63.181(d) that was omitted, including, but not limited to, the date an equipment leak was detected; or the date of the first or last attempt at repair.

Specific penalties for an incomplete record violation should be determined based on factors such as the following:

- Quantity of information missing;
- Overall importance of the missing information to the regulatory requirements; and,
- Relative importance of the missing information compared to information that is present.

B. Reporting Violations

Reporting requirements are instrumental for assessing compliance. There are several reporting requirements found in the equipment leak provisions. While the regulations require that certain reports be completed only once (e.g., Initial Notification, Notification of Compliance Status), other reports must be submitted at regular intervals (e.g., semi-annual reports). Violations of reporting requirements include; (1) failure to submit a report, (2) submitting an incomplete report, and, (3) late submission of a report. Use Table 2 to calculate the penalty for reporting violations.

Incomplete reports include reports submitted pursuant to a regulatory section that are missing certain information required by that section. As with recordkeeping violations, the case team will evaluate numerous factors in order to determine an appropriate penalty amount within the range listed in Table 2. The factors include, but are not limited to: the quantity of missing information; the overall importance of the missing information to EPA's ability to evaluate the company's compliance with the regulations; the relative importance of the missing information compared to the information that is present; or the degree of inattention to the regulatory requirements that the company manifests in failing to record the missing information. Based on the factors set forth above, the case team may develop a method for determining the percentage of the total information that is missing from the report, and that percentage can be used in developing the final figure.

The minimum penalty for any reporting violation is $250. Such a violation may include, for example, the omission of one piece of equipment from a report. For example, 40 C.F.R. § 63.182(d)(3)(iv) requires that owners or operators who elect to meet the requirements of 40 C.F.R. § 63.178(b) relating to batch processes report the facts that explain any delay of repairs when an equipment train failed a pressure test. If, for example, a Periodic Report failed to adequately explain any delay of repairs and the owner or operator subsequently provided that information upon request, then EPA may assess a penalty of $250 instead of assessing a penalty for incomplete reports as described above.

TABLE 2. REPORTING VIOLATIONS

Violation	Initial Notification or Notice of Compliance Status	Periodic Report Due Annually	Periodic Report Due Semi-Annually	Quarterly Report
On-time but incomplete.	$250 to $37,500 based on the fraction of missing information.	$250 to $32,500 based on the fraction of missing information.	$250 to $27,500 based on the fraction of missing information.	$250 to $22,500 based on the fraction of missing information.
Late submission of complete report.	$250/day, up to 150 days, cap of $37,500	$250/day, up to 130 days, cap of $32,500	$250/day, up to 110 days, cap of $27,500	$250/day up to 90 days, cap of $22,500
Late submission and report is incomplete.	$250/day, up to 150 days, cap of $37,500, plus $250 to $37,500 based on the fraction of missing information.	$250/day up to 130 days, cap of $32,500, plus $250 to $32,500 based on the fraction of missing information.	$250/day up to 110 days, cap of $27,500, plus $250 to $27,500 based on the fraction of missing information.	$250/day up to 90 days, cap of $22,500, plus $250 to $22,500 based on the fraction of missing information.

Table 2 note: if a facility fails to submit a report, but does so after contact by EPA, then the penalties are assessed as described above for "Late submission of complete report," or, "Late submission and report is incomplete."

C. Failure to Identify Equipment (Including Misidentifying Equipment)

Each piece of regulated equipment in a process unit must be identified so that it can be distinguished readily from equipment that is not subject to an equipment leak regulation. The following guidance generally refers to tagging regulated equipment to comply with the requirement to identify equipment subject to a regulatory subpart, and also applies when companies use records or logs to identify pieces of regulated equipment.

The failure to identify regulated equipment is a violation. Use the penalty matrix in Table 3 to calculate the penalty for failing to identify regulated equipment. The penalty is capped at $2,500,000 for failing to identify regulated equipment, which may be reduced based on the totality of the circumstances and the level of sophistication of the violator.

TABLE 3. FAILURE TO IDENTIFY REGULATED EQUIPMENT

Failure to identify equipment	$250 per valve, flange, connector, open-ended valve or line, sampling connection system, instrumentation system. $1,000 per pump, agitator. $5,000 per compressor, pressure relief device, surge control vessel, bottoms receiver. Penalty Cap: $2,500,000

Table 3 should also be used if equipment has been misidentified as subject to regulation and the inclusion in the monitoring program results in the company improperly calculating its leak percentages. For example, if a company has tagged several valves in a process unit as subject to regulation, but none of the valves are in organic gas or liquid service, these valves will always show no leaks and result in the process unit appearing to have a lower leak rate.

Unidentified equipment may not have been monitored for some or all of the time that it should have been monitored. If the piece of equipment was not monitored as it should have been, additional penalties are calculated and assessed under Section D, below.

D. Inspection and Method 21 Monitoring Violations

Monitoring and inspection of equipment are required at regular intervals to detect leaks of HAP's and/or non-HAP VOC's, and may be required after a leak has been repaired. Monitoring methods include Method 21 (or any subsequent alternative or revision), and visual, auditory, olfactory, or other detection methods approved for use pursuant to the applicable subpart. The frequency of monitoring, also referred to here as monitoring events, depends on the type of equipment. The equipment that is subject to such periodic monitoring includes, but may not be limited to:

- Pumps
- Compressors
- Valves
- Flanges and/or connectors

- Pressure relief valves (PRVs)
- Closed-vent systems (CVS) - hard pipe
- CVS - duct work
- Agitators

Missed Monitoring and Inspection Events. Common monitoring and inspection violations include the following: (i), a complete failure to monitor all of the pieces of equipment in a process unit; (ii), occasional failure to conduct one or more monitoring events on one or more pieces of equipment (e.g., failure to remove insulation during monitoring), including monitoring following repairs; (iii), equipment identified as difficult to monitor in violation of the requirement; (iv), failure to monitor equipment as required after repair; (v), use of an instrument that does not adequately respond to the compounds present (e.g., using a flame ionization detector for formaldehyde leaks); (vi), LDAR personnel are inattentive to the instrumental readout, or they are holding the sample inlet too far from the equipment; (vii), failure to monitor equipment such as valves, flanges, and connectors at the required frequency because the facility incorrectly determined that its leak rate was low enough to allow a reduced frequency of monitoring or monitoring skip periods; or, any combination of the above. Use Table 4 to calculate the penalty for each failure to monitor or inspect.

TABLE 4. MISSED MONITORING AND INSPECTION EVENTS

Per valve, flange, connector;	$100
Per pump, agitator;	$400
Per compressor, PRV, CVS.	$2,000

Note: If equipment is not monitored because it is not identified as regulated equipment in the monitoring program then the penalty is assessed in accordance with Table 3, not Table 4.

Method 21 Calibration Violations. Table 4 is used to assess penalties when certain requirements of Method 21 were not followed during monitoring events, and the failure to follow those requirements is equivalent to a failure to monitor. Such a failure to monitor may occur when, for example, the instrument used to perform monitoring by Method 21 is not calibrated, or the instrument does not pass a calibration check. For example, 40 C.F.R. § 63.180(b)(3) requires that, in the performance of Method 21, "the instrument shall be calibrated before use on each day of its use… ." A failure to calibrate the instrument before monitoring is equivalent to a failure to monitor because there is no information to validate the data collected on that day. In another example, Method 21 section 10.0, *Calibration and Standardization*, states that "if the meter readout cannot be adjusted to the proper value, a malfunction of the analyzer is indicated and corrective actions are necessary before use." Using such an instrument to perform monitoring is equivalent to a failure to monitor.

A failure to monitor may also occur when an instrument is calibrated but the instrument is not used in accordance with Method 21. For example, Method 21, sec. 7.4, provides that "calibrations may be performed using a compound other than the reference

compound...[however]....a conversion factor must be determined for the alternative compound such that the resulting meter readings during source surveys can be converted to the reference compound (i.e., n-hexane) results." If monitoring is conducted using an instrument calibrated with an alternative gas and a conversion factor is not used to adjust the reading to the reference gas, then a failure to monitor may be indicated.

Violations of the Method 21 calibration requirements may occur that do not result in a failure to monitor. For example, Method 21 at section 7.2, *Cylinder Gases*, requires that the gas mixtures used for calibrations be certified to a two percent accuracy standard by the manufacturer, and a have a specified shelf life. Cylinder standards must be either reanalyzed ("recertified") or replaced at the end of the specified shelf life. If, for example, an expired gas cylinder was used for calibration but the cylinder was subsequently recertified and the gas standard concentration was acceptable, then the measurement values collected during the monitoring are likely to be valid. In another example, if the Method 21 instrument was calibrated with a gas cylinder that had a lower accuracy (e.g., five percent accuracy), then the measurement values collected during the monitoring event are less accurate but the data may indicate that no leaks were missed due to the less accurate calibration. A penalty of $250 may be assessed for violating Method 21 calibration requirements when the violations do not appear to invalidate the monitoring event. However, if an expired gas cylinder was used for calibration and the recertified concentration was not acceptable, or the cylinder was not recertified, then the penalty is assessed in the same manner as for a missed monitoring event in accordance with Table 4.

Failure to Perform Method 21 Correctly Based on Comparative Monitoring. With respect to 40 C.F.R. Part 60, appendix A, Reference Method 21, monitoring violations also include the systemic failure to perform the monitoring in accordance with Method 21, sec. 8.3, *Individual Source Surveys*, and as prescribed by the applicable regulations. A systemic failure to perform Method 21 correctly may be indicated when comparative monitoring at the process unit(s) shows a higher calculated leak rate than the company's monitoring records. Penalties for failing to perform monitoring in accordance with Method 21, section 8.3 are assessed in accordance with Table 5.

TABLE 5. FAILURE TO PERFORM MONITORING CORRECTLY

Monitoring Frequency	Penalty per monitoring requirement per process unit
Every 8 years	$18,500
Every 4 years	$15,000
Every 2 years	$12,500
Annual (*e.g.*, connectors)	$10,500
Semi-Annual	$7,500
Quarterly (*e.g.*, valves)	$5,000
Bi-Monthly	$3,500
Monthly (*e.g.*, pumps)	$2,500

E. Failure to Tag Leaking Equipment for Repair

Each piece of equipment that is found to be leaking must be physically tagged to identify it as requiring repair. A failure to do so is a violation. Use Table 6 to calculate the penalty for failing to tag equipment that is found to be leaking, and for failing to keep a tag on the equipment for re-monitoring. If the equipment was repaired on time even though it was not tagged, then EPA has the discretion to reduce or to not assess a penalty as specified in Table 6.

TABLE 6. FAILURE TO TAG LEAKING EQUIPMENT FOR REPAIR OR REMONITORING

Failure to tag equipment where a leak was detected; failure to keep tag on for re-monitoring.	Per valve, flange, connector;	$100
	Per pump, agitator;	$400
	Per compressor, PRV.	$2,000

F. Failure to Repair Leaks on Time or At All

The regulations require owners or operators to make a first attempt at repair within five days of identifying a leak. If the first attempt is ineffective, then a leak must be repaired as soon as practicable, but no later than 15 days after the leak was detected, unless one of the few exemptions apply (e.g., technical infeasibility without a process shutdown). An owner or operator can fail to repair a single piece of equipment within the deadlines on more than one

occasion if the owner or operator finds the component leaking more than once. A penalty is assessed for each failure to comply, even if the same piece of equipment is involved.

Use Table 7 to calculate the penalty for failing to make repairs on time and for failing to make repairs altogether. Identify each equipment piece that was not repaired on time and, for each such piece, determine how many days the company was late in making either the first or final attempt at repair, or both. The maximum duration of time for failing to make a first attempt is capped at 10 days (i.e., days 6 through 15) because after day 15, the violation becomes a failure to make a final attempt at repair. And, even though a failure to make a final attempt at repair can last indefinitely, there is a per-day penalty cap of 125 days for such a failure. Penalties are assessed for each violation per piece of equipment, per day.

TABLE 7. LATE REPAIRS OR NO REPAIRS, PER PIECE OF EQUIPMENT

Failure to perform a first attempt at repair within the required time. Assessed per-day for each day late. Cap: 10 days.	Per piece of equipment per day: Cap per piece of equipment:	$100 $1,000
Failure to perform a final attempt at repair within the required time. Assessed per-day for each day late. Cap: 125 days.	Per valve, flange, connector per day: Cap per valve, flange, or connector: Per pump, agitator per day: Cap per pump, agitator: Per compressor, PRV per day: Cap per compressor, PRV:	$150 $18,750 $500 $62,500 $3,000 $375,000

G. Equipment Standard Violations

An "equipment standard" violation refers to a failure to equip certain equipment in LDAR service with devices that are required by the regulations. For example, open-ended lines must be equipped with a cap, a blind flange, a plug, or a second valve. Compressors must be equipped with a particular type of seal system. There are a variety of different equipment standards and the standards refer to hardware requirements for preventing leaks. Use Table 8 to calculate penalties for each violation of an equipment standard requirement, regardless of the duration of the violation. If evidence exists, however, to demonstrate a long-term violation, the case team has the discretion to upwardly adjust the penalty to account for the potentially greater harm caused by the lengthy duration of the violation.

TABLE 8. EQUIPMENT STANDARD VIOLATIONS

Open-ended lines, sampling connection systems, instrumentation systems.	Per piece of equipment: $750
Compressors, CVS, surge control vessels, bottoms receivers.	Per piece of equipment: $2,000

H. Pressure Testing Violations

When equipment is reconfigured for the production of different products or intermediates, the equipment must be pressure tested for leaks before the equipment is placed in service (see, for example, 40 C.F.R. § 63.178(b)(1)). The penalty for failing to pressure test is $11,250 per failure to test, plus the sum of the per-equipment penalties such as valves and connectors associated with the reconfigured equipment, as listed in Table 9. A failure to pressure test also occurs when procedures for pressure testing are not followed and the test is not valid for the required test objective. For example, 40 C.F.R. § 63.180(g)(1) requires process equipment to be pressurized with a test liquid at normal operating pressure to test for leaks. If the test is conducted at a pressure that is lower than the pressure of normal operations, then leaks may not occur during the test that would otherwise exist at the higher operating pressure. The penalty for invalid testing is assessed in accordance with Table 9, in the same manner as for a failure to pressure test.

TABLE 9. FAILURE TO PRESSURE TEST

Per valve, flange, connector;	$100
Per pump, agitator;	$400
Per compressor, PRV, CVS.	$2,000

When pressure testing is conducted and a leak is detected, the leak must be repaired and the equipment must be retested before start-up of the process. If the equipment fails the second test, then the leak must be repaired as soon as practicable but not later than 30 days following the retest (see, for example, 40 C.F.R. § 63.178(b)(4)). If the leak is not repaired before start up, or within 30 days, then the penalty for delaying the repair is assessed in accordance with Table 10.

TABLE 10. PRESSURE TEST DELAY OF REPAIR

Failure to repair leaks before equipment start up, or within the required time following a retest. Assessed per-day. Cap: 125 days.	Per valve, flange, connector, per day: Cap per valve, flange, connector: Per pump, agitator per day: Cap per pump, agitator: Per compressor, PRV per day: Cap per compressor, PRV:	$150 $18,750 $500 $62,500 $3,000 $375,000

Violations of required pressure test procedures may occur that do not invalidate the test. For example, 40 C.F.R. § 63.180(f)(3) provides an equation that must be used to determine the change in pressure per hour, in units of pounds per square inch gauge (psig), during the test. If the owner or operator uses other units of pressure such as atmospheres, inches of mercury, etc., then the requirement of the regulation was not met. A penalty of $250 may be assessed for violating test requirements where the violations do not void the test results.