

Leak Detection & Repair

Planning & Implementing an LDAR Program

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Introduction

Leak Detection & Repair = LDAR =



This is a quick summary of common LDAR program elements, challenges, and options. Key points discussed will include:

- Regulatory Considerations
- Leak Detection Methods
- Recordkeeping

Where Does LDAR Come From?



LDAR is typically invoked by NESHAP rules to control fugitive emissions (don't forget RCRA!)

The list on the right is from Appendix A of EPA's LDAR Best Practices Guide

<http://www.epa.gov/compliance/resources/publications/assistance/ldarguide.pdf>

RCRA Subpart BB is old by LDAR standards with generous leak definitions – and applies to LQG with <90 day tanks.

When 2 standards overlap, use the most stringent!

40 CFR		Regulation Title
Part	Subpart	
60	VV	SOCMI VOC Equipment Leaks NSPS
60	DDD	Volatile Organic Compound (VOC) Emissions from the Polymer Manufacturing Industry
60	GGG	Petroleum Refinery VOC Equipment Leaks NSPS
60	KKK	Onshore Natural Gas Processing Plant VOC Equipment Leaks NSPS
61	J	National Emission Standard for Equipment Leaks (Fugitive Emission Sources) of Benzene
61	V	Equipment Leaks NESHAP
63	HH	Organic HAP Equipment Leak NESHAP (HON)
63	I	Organic HAP Equipment Leak NESHAP for Certain Processes
63	J	Polyvinyl Chloride and Copolymers Production NESHAP
63	R	Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations)
63	CC	Hazardous Air Pollutants from Petroleum Refineries
63	DD	Hazardous Air Pollutants from Off-Site Waste and Recovery Operations
63	SS	Closed Vent Systems, Control Devices, Recovery Devices and Routing to a Fuel Gas System or a Process
63	TT	Equipment Leaks – Control Level 1
63	UU	Equipment Leaks – Control Level 2
63	YY	Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards
63	GGG	Pharmaceuticals Production
63	III	Hazardous Air Pollutants from Flexible Polyurethane Foam Production
63	MMM	Hazardous Air Pollutants for Pesticide Active Ingredient Production
63	FFFF	Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing
63	GGGG	Hazardous Air Pollutants: Site Remediation
63	HHHH	Hazardous Air Pollutants: Miscellaneous Coating Manufacturing
65	F	Consolidated Federal Air Rule – Equipment Leaks
265	BB	Air Emission Standards for Equipment Leaks

Study, Study, Study the Rules

Subpart H—National Emission Standards for Organic Hazardous Air Pollutants for Equipment Leaks

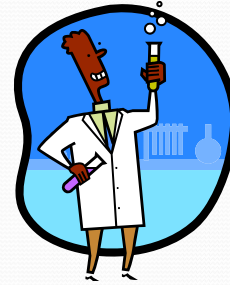
603.160	Applicability and designation of source
603.161	Definitions – <i>see 63.1251</i>
603.162	Standards: General – <i>see 63.1255(a)</i>
603.163	Standards: Pumps in light liquid service – <i>see 63.1255(c)</i>
603.164	Standards: Compressors
603.165	Standards: Pressure relief devices in gas/vapor service
603.166	Standards: Sampling connection systems
603.167	Standards: Open-ended valves or lines – <i>see 63.1255(c)(4)</i>
603.168	Standards: Valves in gas/vapor service and in light liquid service – <i>see 63.1255(d)</i>
603.169	Standards: Pumps, valves, connectors, and agitators in heavy liquid service; instrumentation systems; and pressure relief devices in liquid service
603.170	Standards: Surge control vessels and bottom receivers – <i>see 63.1254</i>
603.171	Standards: Delay of repair
603.172	Standards: Closed-vent systems and control devices
603.173	Standards: Agitators in gas/vapor service and in light liquid service
603.174	Standards: Connectors in gas/vapor service and in light liquid service
603.175	Quality improvement program for valves
603.176	Quality improvement program for pumps
603.177	Alternative means of emission limitation: General
603.178	Alternative means of emission limitation: Batch processes
603.179	Alternative means of emission limitation: Enclosed-vented process units
603.180	Test methods and procedures
603.181	Recordkeeping requirements – <i>see 63.1255(g)</i>
603.182	Reporting requirements – <i>see 63.1255(h)</i>
603.183	Implementation and enforcement
Table 1	to Subpart H of Part 63—Batch Processes
Table 2	to Subpart H of Part 63—Surge Control Vessels and Bottoms Receivers at Existing Sources
Table 3	to Subpart H of Part 63—Surge Control Vessels and Bottoms Receivers at New Sources
Table 4	to Subpart H of Part 63—Applicable 40 CFR Part 63 General Provisions

Highlighted sections do not apply per 63.1255(b)(2)

Sometimes the rules are a hybrid of several regulations, which takes time to unravel

Understand Your Exemptions

- Get Hooked on classics like <300 hours, inaccessible, unsafe to monitor, leakless valves, sealless pumps, etc.
- Dabble in the obscure exemptions for instrumentation, glass & ceramic equipment, lab equipment, as well as rule-specific treats.



KEY POINT: Keep a list of any exemptions that may apply and a detailed inventory of which components qualify for the exemption

Easter Eggs!

Take advantage of rule-specific allowances and definitions; but stake your claims early! You probably can't invoke an exemption after the fact during an inspection...

§ 63.2480 What requirements must I meet for equipment leaks?

(a) You must meet each requirement in table 6 to this subpart that applies to your equipment leaks, except as specified in paragraphs (b) through (d) of this section.

(b) If you comply with either subpart H or subpart UU of this part 63, you may elect to comply with the provisions in paragraphs (b)(1) through (5) of this section as an alternative to the referenced provisions in subpart H or subpart UU of this part.

(1) The requirements for pressure testing in § 63.179(b) or § 63.1036(b) may be applied to all processes, not just batch processes.

(2) For the purposes of this subpart, pressure testing for leaks in accordance with § 63.179(b) or § 63.1036(b) is not required after reconfiguration of an equipment train if flexible hose connections are the only disturbed equipment.

(3) For an existing source, you are not required to develop an initial list of identification numbers for connectors as would otherwise be required under § 63.1022(b)(1) or § 63.181(b)(1)(i).

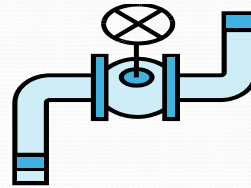
(4) For connectors in gas/vapor and light liquid service at an existing source, you may elect to comply with the requirements in § 63.1057 or § 63.1058 for connectors in heavy liquid service, including all associated recordkeeping and reporting requirements, rather than the requirements of § 63.171 or § 63.1097.

(5) For pumps in light liquid service at an MCMU that has no continuous process vents and is part of an existing source, you may elect to consider the leak definition that defines a leak to be 10,000 parts per million (ppm) or greater as an alternative to the values specified in § 63.1022(b)(1) through (4) or § 63.1036(b)(2).

(c) If you comply with 40 CFR part 65,

Count Your Population

- Component counts are key for effective programs and can be a source of enforcement.
- Keep an up to date list of each category of covered components – and exempted ones too.
- Tagging is not always required – do you need it?
- Keep the list up to date (MOCs?)
- Beware of cascading violations



Methods for LDAR Madness!

- Understand the methods and alternatives – even if you don't do the monitoring yourself.
- Method 21 is the gold standard everyone is compared against – and the easiest to audit
- Pressure testing is a mixed blessing but has distinct advantages (and limitations)
- Remember the sensory method has merit too

KEY POINT: Know which test methods your rule permits and then decide how to implement each method at your facility.

Leaks Stink! (sometimes)



Audible, Visual, and Olfactory detection method (aka: sensory leak detection).

In some cases the sensory method is sufficient to meet LDAR requirements – such as MON or 6V Area Source Rule.

In most cases it will also start your leak repair clock (5/15).

Method 21 – The Albatross



The equipment is heavy, bulky, and usually carried around like an albatross

Method 21 is the gold standard of LDAR, providing a clear quantitative result.

Most leak definitions are based on Method 21.

There are well defined calibration requirements, quarterly drift tests, and sampling guidelines.

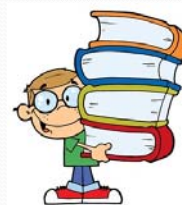
Managing the 5/15 Clock



- Most LDAR programs require a first attempt at repair within 5 days of discovering a leak and repair completion within 15 days.
- Anyone can discover a leak, which is both good and bad. Be sure any leak discovered is tracked in the LDAR program – even if it was discovered by somebody else.
- Consider methods to track repairs to covered equipment: even non-LDAR repairs may require leak testing prior to putting the equipment in service.

Recordkeeping is Critical

- Keeping good records is a critical part of any LDAR program.
 - Written LDAR Procedures & Training
 - Instrument Calibration Records
 - Component Counts & Classifications
 - Monitoring & Repair Records
- Be sure you know how to find/access LDAR records
- If a contractor manages your LDAR database, how do you get access?



Putting it All Together



- Understand the underlying regulations
- Maintain a current inventory (including exempt items)
- Have a written program that includes your covered equipment, testing procedures, and record keeping
- Ensure you have quick access to any 3rd party information you may need during an audit.
- If you do your own Method 21 – remember cal gas dates, daily checks, & quarterly drift test

The End



THANK
YOU