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## FL Section A&WMA - Working Group Wednesday

# Understanding the Revised Section 608 Rules: Refrigerant Management Regulations

Michael Ballenger, P.E.

Principal Consultant

[mballenger@trinityconsultants.com](mailto:mballenger@trinityconsultants.com)



# Agenda

- > Introduction to refrigerant rules and basic refrigerant types
- > Refrigerant phase out or phase down
  - ❖ EPA's Significant New Alternatives Policy (SNAP) Program
  - ❖ Montreal Protocol
- > Appliance servicing requirements
  - ❖ EPA's 11/18/2016 rule revisions
- > Tips for facilities and HVAC/R contractors
- > Q&A

# Introduction to Environmental Requirements for Refrigerants

Montreal Protocol

- > **International treaty** - established in 1987 in response to hole in ozone layer that forms over Antarctica each year
  - ❖ Targets ODS, including CFCs and HCFCs
  - ❖ Amended several times using “worst first” approach; recently amended to target HFCs

Clean Air Act, Title VI

- > **U.S. law or statute** - gives EPA authority to develop rules to implement requirements in Montreal Protocol

40 CFR Part 82

- > **EPA rule** - what you have to comply with on day-to-day basis

# Basic Refrigerant Types (1 of 2)

- > CFCs - chlorofluorocarbons (e.g., R-11, R-12)
  - ❖ 1st generation refrigerants
  - ❖ Class I ozone depleting substances (ODSs) with ozone depletion potential (ODP) > 0.2
  - ❖ Production phased out since 1996
- > HCFCs - hydrochlorofluorocarbons (e.g., R-22, R-141b, R-142b)
  - ❖ 2nd generation refrigerants
  - ❖ Class II ODSs with ODP < 0.2
  - ❖ Production being phased out by 2020 (R-22 phase out started in 2010)

# Basic Refrigerant Types (2 of 2)

- > HFCs - hydrofluorocarbons (e.g., R-134a, R-407C, R-410A)
  - ❖ 3rd generation refrigerants
  - ❖ non-ODS, but several have high global warming potential (GWP)
  - ❖ Production targeted for future phase down
- > Next generation refrigerants
  - ❖ Non-ODS and low GWP
  - ❖ Hydrocarbons - e.g., R-290 (propane), R-600a (isobutane)
  - ❖ Hydrofluoroolefins (HFOs) - e.g., R-1234yf
  - ❖ HFC/HFO blends - e.g., R-448A, R-449A

# How Do EPA's Refrigerant Rules Impact Facilities and HVAC/R Technicians/Contractors?

## 1. Phase Out of Specific Refrigerants (Subparts A, C, G, & I)

- > CFCs phased out of production in 1996 (e.g., R-11, R-12)
- > HCFCs being phased out of production (e.g., R-22) by 2020
- > HFCs now targeted for phase down
- > SNAP Program approves/disapproves substitutes
- > Reduces supply and increases cost

## 2. Required Practices When Working on AC Units (Subparts B & F)\*

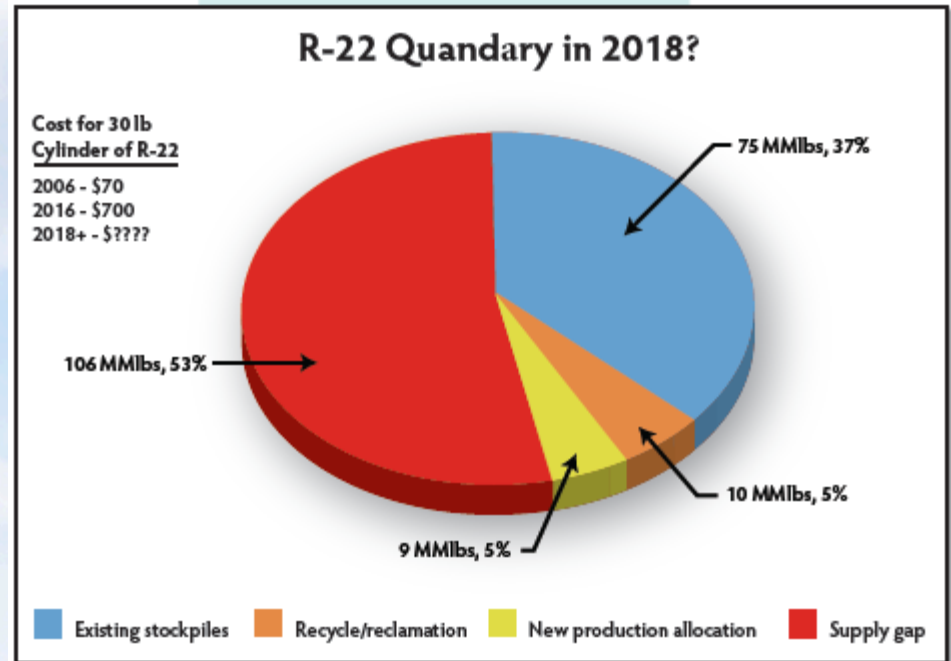
- > Technician certifications
- > Evacuation & recovery (no venting)
- > Disposal requirements
- > Sales restrictions
- > Leak repair provisions for units with full charge  $\geq 50$  lbs
- > Promotes recovery, recycling, & reclamation

\*Commonly referred to as Clean Air Act Section 609 (mobile) and Section 608 (stationary) provisions

# 1. Developments in Refrigerant Phase Out Schedules

# HCFC Phase Out is Here

- > HCFC production phase out schedule
  - ❖ 2015 = 90%
  - ❖ 2020 = 99.5% overall and 100% for R-22 & R-142b
  - ❖ 2030 = 100%
- > R-22 quandary?
  - ❖ EPA production allocations = 13 million lbs (2017), 9 million lbs (2018), & 4 million lbs (2019)
  - ❖ EPA estimates recycle/reclamation < 10 million lbs/year in 2016
  - ❖ Represent only a fraction of the ~200 million lb/year service need in the U.S.
- > Costs for R-22 have already risen 10x since 2006





# HFCs are the New Target

- > HFCs (e.g., R-134a, R410A), which are the most common replacement for HCFCs, are the new target since they are potent GHGs
- > HFC targeting mechanisms
  - ❖ EPA's SNAP Program
  - ❖ Kigali Amendment to Montreal Protocol
  - ❖ Expansion of 40 CFR 82, Subpart F (i.e., CAA Section 608) provisions to non-ODS substitutes
    - ◆ Will cover in Section 2

# How Should Facilities Prepare for Impending Refrigerant Phase Outs?

- > Facility managers must develop inventory of appliances (age, size, refrigerant type) to quantify exposure to expected rise in refrigerant costs
- > Watch for availability of next generation refrigerants (e.g., HCs, HFOs, HFO/HFC blends)
  - ❖ Obtain input from appliance manufacturers and HVAC/R contractors
- > Analyze new AC/R unit installations and retrofits based on available cost data and unit lifetimes
  - ❖ If R-407C is facing an impending phase down, does it make sense to switch your R-22 unit to R-407C?

## 2. Developments in Required Work Practices when Servicing Refrigerant Containing Appliances

# Subpart F Matrix by Appliance & Refrigerant Type (prior to rule revision)

Category	Venting Prohibition	Sales Restrictions	Evacuation Req's	Technician Certs	Disposal Req's	Leak Repair Provisions
Appliances w/ Non-ODS Substitutes	Yes (unless listed as exempt)	No	No	No	No	No
Small Appliances ( $\leq 5$ lbs ODS)	Yes	Yes	Yes (specific)	Yes	Yes (specific)	No
Medium Appliances (> 5 lbs & < 50 lbs ODS)	Yes	Yes	Yes	Yes	Yes (no explicit records)	No
Large Appliances ( $\geq 50$ lbs ODS)	Yes	Yes	Yes	Yes	Yes	Yes

# Leak Rate Provisions for Comfort Cooling Appliances - Overview (prior to rule revision)

- > Applicable to units with full charge  $\geq 50$  lbs ODS-containing refrigerant
  - ❖ Applicability determined on a circuit-by-circuit basis
- > If the leak rate  $\geq$  applicable “trigger rate” (15% for comfort cooling appliances)
  - ❖ The leak should be repaired within 30 days\*, or
  - ❖ The system should be retrofitted (within 1 year), or
  - ❖ The system should be retired from service (within 1 year)
- > \*One option to extend repair window - mothballing (evacuation & shutdown)
- > Servicing records required
  - ❖ Date & type of service
  - ❖ Amount of refrigerant added
  - ❖ Date & amount of refrigerant purchased (if add own refrigerant)

# Leak Rate Calculation Example

- > Determines the amount of refrigerant that would leak out in a year if nothing done
- > Example (using "Annualizing Method"):
  - Day 1 - Unit fully charged with 250 lbs of R-22
  - Day 8 - Unit found to have lost 2 lbs of R-22

Leak Rate = 41.7% =

$$\left( \frac{2 \text{ lbs refrigerant added}}{250 \text{ lbs refrigerant in full charge}} \right) \times \left( \frac{365 \text{ day/yr}}{7 \text{ days since refrigerant last added}} \right) \times 100$$

# Refrigerant Servicing Rule Revisions

- > Rule represents overhaul of 40 CFR 82, Subpart F
- > Finalized on 11/18/2016 (81 FR 82272)
- > Includes 3 primary categories of changes
  - ❖ Extension to non-ODS containing substitutes
  - ❖ Revised appliance disposal requirements
  - ❖ Revised leak repair provisions for appliances with full charge  $\geq$  50 lbs
- > Staggered compliance dates of 1/1/2017, 1/1/2018, & 1/1/2019

# Extension to Non-ODS Substitutes, 1/1/2017

- > Substitutes are defined as refrigerants, with the following subcategories:
  - ❖ Non-exempt substitutes - subject to all provisions of rule, including sales restrictions, evacuation, recovery/recycling equipment, technician certification, leak repair, and reclamation provisions
  - ❖ Exempt substitutes - exempt from all provisions of rule when used in approved applications



# Extension to Non-ODS Substitutes - Highlights

- > Newly manufactured recovery/recycling equipment must be certified, **1/1/2017** (82.158)
- > Restriction on sale of refrigerant, **1/1/2017 & 1/1/2018** [82.154(c)-(d)]
- > Technicians must be certified, **1/1/2018** [82.161(a)]
- > Evacuation requirements for disposal or opening of appliances, **1/1/2018** [82.155 & 82.156(a)-(d)]
- > Leak repair provisions as they apply to appliances with full charge  $\geq$  50 lbs refrigerant, **1/1/2019** (82.157)

# Revised Small Appliance Disposal Requirements

- > Two options for final processors (e.g., scrap recyclers, landfills) when disposing of small ( $\leq 5$  lb) appliances\*
  - ❖ Option 1 - evacuate and recover refrigerant
  - ❖ Option 2 - verify that refrigerant has been evacuated previously via A) signed statements or B) contract
- > 2016 rule
  - ❖ Relocates these provisions from 82.156(f) & 82.166(i) to 82.155
  - ❖ Under Option 2, adds requirement to obtain signed statement when all refrigerant in an appliance has “leaked out” prior to delivery due to unavoidable occurrences
  - ❖ Effective date = 1/1/2017 for ODS-containing refrigerants and 1/1/2018 for non-exempt substitutes

\*Also applies to disposal of MVACs and MVAC-like appliances

# New Medium Appliance Disposal Requirements, 1/1/2018

- > 2016 rule adds explicit technician recordkeeping requirements for disposal of appliances with full charge > 5 lbs and < 50 lbs [82.156(a)(3)]
  - ❖ Company name
  - ❖ Location of the appliance
  - ❖ Date of recovery
  - ❖ Type of refrigerant recovered for each appliance
  - ❖ The quantity of refrigerant, by type, recovered from all disposed appliances in each calendar month
  - ❖ The quantity of refrigerant, by type, transferred for reclamation and/or destruction
  - ❖ The person to whom it was transferred
  - ❖ The date of transfer
- > Owners/operators only required to maintain these records if directly employ technicians

# Revisions to Leak Repair Provisions for $\geq 50$ lb Units - Highlights, 1/1/2019

- > Extends applicability to appliances that contain non-exempt substitutes (e.g., HFCs)
- > Lowers allowable leak (or repair “trigger”) rates [82.157(c)(2)]
  - ❖ Comfort cooling & other units - 15% to 10%
  - ❖ Commercial refrigeration - 35% to 20%
  - ❖ Industrial process refrigeration - 35% to 30%

# Revisions to Leak Repair Provisions for $\geq 50$ lb Units - Highlights, 1/1/2019

- > Initial and follow-up verification testing
  - ❖ Now required for **all appliance types**, including comfort cooling and commercial refrigeration (was only req'd for industrial units previously)
  - ❖ **Shortens window** for performing follow-up verification test from 30 days to 10 days of initial verification test or of the appliance achieving normal operating characteristics and conditions
- > Standard list of extensions to 30-day repair window for **all appliance types**
  - ❖ Mothballing, necessary parts unavailable, radiological contamination issues, & other rules make repair within window impossible
  - ❖ 120-day repair window if industrial process shutdown (IPS) required to make repair still reserved for IPRA's

# Revisions to Leak Repair Provisions for $\geq 50$ lb Units - Highlights, 1/1/2019

- > Establishes leak inspection requirements if exceed allowable leak rates [82.157(g)]
  - ❖ Commercial/industrial process refrigeration  $\geq 500$  lbs - quarterly, until 4 consecutive quarters w/ no leaks above allowable leak rate
  - ❖ All other units  $\geq 50$  lbs - once per calendar year, until 1 year w/ no leaks above allowable leak rate
  - ❖ Must be performed by certified technicians
  - ❖ Not required if equipped with automatic leak detection system

# Revisions to Leak Repair Provisions for $\geq 50$ lb Units - Highlights, 1/1/2019

- > Reporting required for appliances  $\geq 50$  lbs that leak more than 125% of their full charge in calendar year [82.157(j)]
  - ❖ “Chronic leaker” provision
  - ❖ Calculation = amount added / full charge (do not use standard leak rate calculation methods for this purpose)
  - ❖ Due 3/1 of following year

# Revisions to Leak Repair Provisions for ≥ 50 lb Units - Recordkeeping [82.157(I)], 1/1/2019

- > Expanded servicing records (ID/location of appliance, date of service, parts of appliance serviced and type of service made to each part, name of person performing the service, amount and type of refrigerant added to or removed, full charge, leak rate, leak rate method used)
- > Expanded full charge records (full charge, method used, revisions, and date of revisions) for all full charge methods
- > Expanded verification test records (location of repairs tested, date, type, and results)
- > Adds explicit records for mothballing (date and return to service)
- > Adds explicit records for seasonal variance (dates of removal and corresponding addition)
- > Adds records of leak inspections (date, method used, leak locations, and certification that all visible parts inspected)
- > Adds records for automatic leak detection systems (installation, annual audit and calibration, and date/location of leaks detected)
- > Purged refrigerant records (when exempting from leak rate calculations)
- > Copies of reports and requests submitted to EPA
- > Copies of retrofit/retirement plans

Red = New



# Revisions to Leak Repair Provisions for ≥ 50 lb Units - Clarifies Who is Responsible for Servicing Records [82.157(I)(2)], 1/1/2019

(2) Owners or operators must maintain a record including the following information for each time an appliance with a full charge of 50 or more pounds is maintained, serviced, repaired, or disposed of, when applicable. If the maintenance, service, repair, or disposal is done by someone other than the owner or operator, that person must provide a record containing the following information, with the exception of (I)(2)(vii) and (viii) of this section, to the owner or operator:

- > Similar language in leak inspection (I)(3) and verification testing (I)(5) recordkeeping provisions

# Revisions to Leak Repair Provisions - Notifications & Reporting

- > Eliminates one-time notification of acquisition of certified recovery/recycling equipment  
(effective date = 1/1/2017)
- > Requires notifications/reports to be submitted electronically to [608reports@epa.gov](mailto:608reports@epa.gov) [82.157(m)]  
(effective date = 1/1/2019)
  - ❖ E.g., repair window extension requests, chronic leaker reports
  - ❖ Can use now per EPA

# Subpart F Matrix by Appliance & Refrigerant Type (after rule revision)

Category	Venting Prohibition	Sales Restrictions	Evacuation Req's	Technician Certs	Disposal Req's	Leak Repair Provisions
Appliances w/ Exempt Substitutes	No	No	No	No	No	No
Small Appliances (≤ 5 lbs ODS or Non-Exempt Substitute)	Yes	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/17 – Used Ref 1/1/17 – Appliances 1/1/18 – New Ref	Yes (specific) <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes (specific) <u>"Leaked out" Records Req'd on:</u> 1/1/17 – ODS 1/1/18 – Non-Exempt Subs	No
Medium Appliances (> 5 lbs & < 50 lbs ODS or Non-Exempt Substitute)	Yes	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/17 – Used Ref 1/1/17 – Appliances 1/1/18 – New Ref	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes <u>Explicit Records Req'd on:</u> 1/1/18 – ODS 1/1/18 – Non-Exempt Subs	No
Large Appliances (≥ 50 lbs ODS or Non-Exempt Substitute)	Yes	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/17 – Used Ref 1/1/17 – Appliances 1/1/18 – New Ref	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes <u>Applies to Non-Exempt Subs on:</u> 1/1/18	Yes <u>82.156(i) Applies thru:</u> 12/31/18 – ODS  <u>82.157 Applies starting:</u> 1/1/19 – ODS 1/1/19 – Non-Exempt Subs

# How Should Facilities Prepare for Subpart F Revisions?

- > Use EPA required work practices previously reserved for ODS-containing refrigerants (e.g., R-12, R-22) on non-ODS substitutes (e.g., R-134a, R-410A)
  - ❖ Certified technicians
  - ❖ Certified recovery/recycling equipment
  - ❖ Required refrigerant evacuation levels
- > Implement changes to appliance disposal recordkeeping system
- > Prepare for new leak repair provisions on  $\geq 50$  lb units
  - ❖ Conduct initial and follow-up verification testing for all leaks
  - ❖ Implement system to maintain new records
  - ❖ Test drive in 2018

# Late Breaking News - EPA May Revisit Portions of Subpart F Revision

- > 8/10/2017 letter from EPA to industry groups indicates it may:
  - ❖ Revisit aspects of extension to non-ODS substitutes and
  - ❖ Consider feasibility of meeting 1/1/2018 compliance date
  - ❖ **Unified Agenda indicates proposal expected in 4/2018 and final action by 12/2018**

This letter relates to concerns that you have raised regarding the U.S. Environmental Protection Agency's final rule titled "Protection of Stratospheric Ozone: Update to the Refrigerant Management Requirements under the Clean Air Act," 81 Fed. Reg. 82272 (November 18, 2016). The EPA is planning to issue a proposed rule to revisit aspects of the 2016 rule's extension of the 40 CFR part 82 subpart F refrigerant management requirements to non-exempt substitutes. We are also aware of your concerns regarding the feasibility of meeting the January 1, 2018, compliance dates and will consider options for relief if we receive adequate information from you to substantiate the basis for such relief.

# Questions?

## Contact Information:

Michael Ballenger, P.E.

(407) 982-2891

[mballenger@trinityconsultants.com](mailto:mballenger@trinityconsultants.com)



## EQ article provided at:

<https://www.trinityconsultants.com/news/federal/refrigerant-rule-revisions--is-your-facility-prepared>

## Complete summary table in PDF format provided at:

<http://www.trinityconsultants.com/Documents/Summary-of-Key-Revisions-to-Refrigerant-Management->