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Refrigerant Rule Update

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Jennifer Markwardt
Senior Consultant

jmarkwardt@trinityconsultants.com



Agenda

- > 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

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

1. Developments in Refrigerant Phase Out Schedules

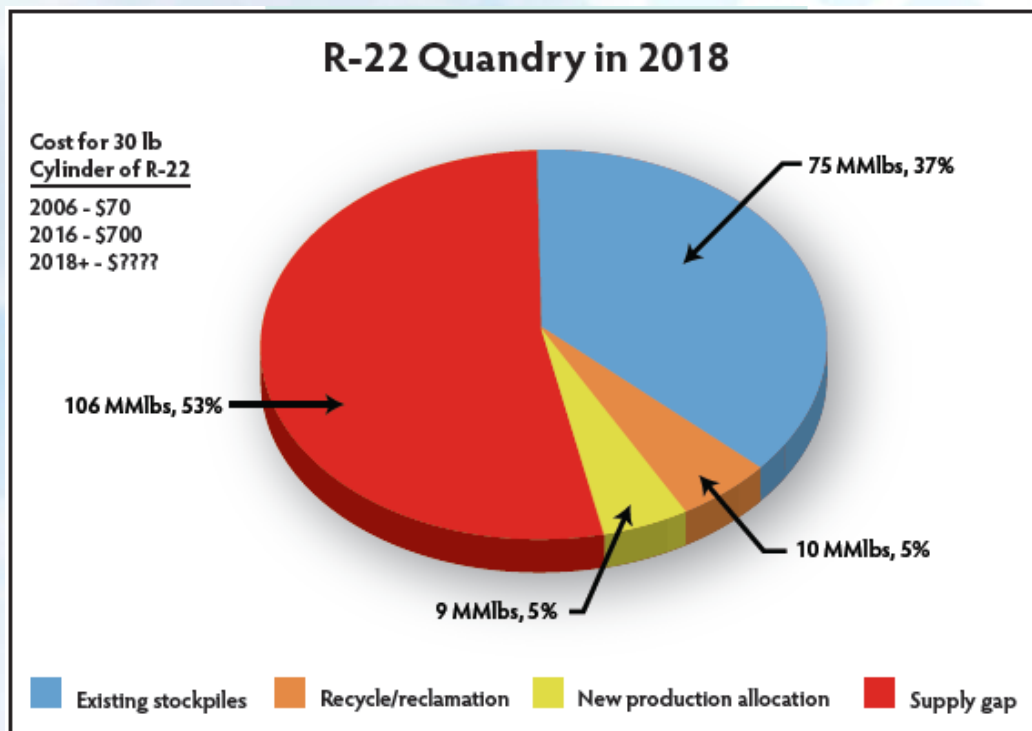
HCFC Phase Out is Here

- > 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)

HFCs are the New Target - Kigali Amendment

- > HFC phase down within Kigali Amendment to Montreal Protocol, 10/15/2016
 - ❖ 2019 - 10%
 - ❖ 2024 - 40%
 - ❖ 2029 - 70%
 - ❖ 2034 - 80%
 - ❖ 2036 - 85%
 - ❖ Relative to 2011-2013 HFC baseline + 15% of HCFC/CFC baseline
- > Trump Administration expected to ratify since has industry backing?

Phase Out & SNAP Impacts

Example: Comfort Cooling Centrifugal Chillers

Not a comprehensive list.

| SNAP Rule Date: | 1994 | 1996 | 2002 | 2016 | 2017+ |
|---|------------------------------|---|---|---|-------|
| Commercial Comfort Cooling; Chiller - Centrifugal | R-22 Substitute for R-12 (N) | R-410A (N) or R-407C (N) for R-12 & R-22 or R-407C (R) for R-22 | R-410A (N) or R-407C (N/R) for R-22 & HCFC blends | R-407C & R-410A Unacceptable (N) 1/1/2024* | ?? |

N = New units. R = Retrofits. *Exemptions available.



| Date: | 1996 | 2006 | 2010 | 2016 | 2017 | 2019 | 2020 | 2024 | 2029 | 2034 | 2036 |
|-----------------------------|------|-------|------|---------|-------|------|------|------|------|------|------|
| R-12 Phaseout | 100% | | | | | | | | | | |
| Price per 30 lb tank R-12 | | \$866 | | \$1,200 | | ?? | | | | | |
| R-22 Phaseout | | | 75%* | | | | 100% | | | | |
| Price per 30 lb tank R-22 | | \$72 | | \$730 | \$747 | ?? | | | | | |
| HFC Phaseout** | | | | | | 10% | | 40% | 70% | 80% | 85% |
| Price per 30 lb tank R-410A | | \$240 | | \$198 | | ?? | | | | | |

*75% reduction in HCFCs based on no production or import of R-142b and R-22, except for use in equipment manufactured before 1/1/2010.

**As included under Kigali Amendment; not yet ratified by U.S.

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-410A is facing an impending phase down, does it make sense to switch your R-22 unit to R-410A?

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

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

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
 - ❖ 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.

Revisions to Leak Repair Provisions for ≥ 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 ≥ 50 lb Units - Highlights, 1/1/2019

- > Establishes leak inspection requirements if exceed allowable leak rates [82.157(g)]
 - ❖ Commercial/industrial process refrigeration ≥ 500 lbs - quarterly, until 4 consecutive quarters w/ no leaks above allowable leak rate
 - ❖ All other units ≥ 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 ≥ 50 lb Units - Highlights, 1/1/2019

- > Reporting required for appliances ≥ 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(l)], 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

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
- > Prepare for new leak repair provisions on ≥ 50 lb units
 - ❖ Conduct initial and follow-up verification testing for all leaks
 - ❖ Implement system to maintain new records
 - ❖ Test drive in 2018

Questions?

Contact Information:

Jennifer Markwardt

(636) 256-5652

jmarkwardt@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->

Unified Agenda Reference:

<https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201710&RIN=2060-AT81>

Upcoming Compliance Workshop for Refrigerants & ODS:

Webinar - 9/27/2018 (4-5 hours)