

USEPA REFRIGERANT MANAGEMENT RULES PREPARING FOR AUDITS UNDER THE REVISED REGULATIONS

A&WMA Southern Section Annual Meeting

Huntsville, Alabama

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BACKGROUND

- Montreal Protocol
 - Agreed - 1987
 - Effective – 1989
 - Objective: Protecting the ozone layer by phasing out the use of ozone depleting substances (ODS)
 - Ratified by the United States – 1988
- For reference,
 - R-11 refrigerant was given an ozone depleting potential (ODP) of 1.0
 - ODP > 0.2 – Class I (Chlorofluorocarbons [CFCs])
 - ODP < 0.2 – Class II (Hydrochlorofluorocarbons [HCFCs])
- CFCs were initially phased out; HCFCs are currently in the process (Complete phase out scheduled for 2030)

USEPA'S SIGNIFICANT NEW ALTERNATIVES POLICY (SNAP)

- If uncontrolled, HFC emissions will triple by 2030.
- Kigali Amendment to the Montreal Protocol is addressing this issue on an international level.
- The April 2015 and December 2016 SNAP regulations would result in phaseout of many currently popular refrigerants (e.g., HFCs; depends on use):
 - R-134A, R-404A, R-407C, R-410A, and R-507A
- The SNAP rule is currently being litigated
 - US Court of Appeals ruled against USEPA in August 2017 and remanded the SNAP rule back to the agency to revise
 - USEPA issued a notice in April 2018 that the SNAP rule is on hold pending further rulemaking
 - USEPA is being sued by 11 state Attorneys General for not following proper procedures in staying the rule
 - Air-Conditioning, Heating, & Refrigeration Institute issued a report in April 2018 supporting the Kigali Amendment and the SNAP rule: http://www.ahrinet.org/App_Content/ahri/files/RESOURCES/Kigali_JMS_04-19-18.pdf
- Important to note that “phaseout” refers primarily to refrigerant manufacturers (i.e., no production or imports). However, if implemented, certain refrigerants would be more difficult and costly to obtain.
 - Does not mean that you need to immediately replace old appliances or existing refrigerant.

THREE KEY CHANGES IN REVISED REGULATION

1. Requirements that previously only applied to a subset of refrigerant types (i.e., “Class I” and “Class II” refrigerants) now apply to all refrigerants that are not “exempt.”
2. Requirements applying to safe disposal of refrigerant-containing appliances have been extended to apply more broadly to both certified appliance technicians and owners/operators of appliances.
3. Appliance maintenance and leak repair requirements have been revised in both applicability (to include more appliance and refrigerant types) and scope (to include more detailed requirements).

IMPORTANT COMPLIANCE DATES

January 2017

- General Applicability / Prohibitions (Extended to All Refrigerants)
- Standards for Recovery and/or Recycling Equipment
- Technician Certification
- Reclaimer Certification

January 2018

- Technician Certification (All Requirements)
- Safe Appliance Disposal
- Proper Evacuation of Refrigerant from Appliances

January 2019

- Appliance Maintenance and Leak Repair Requirements

PREPARING FOR AN AUDIT UNDER THE UPDATED REFRIGERANT MANAGEMENT REGULATIONS

- Prepare an appliance and refrigerant inventory
 - What types of appliances are present at your facility?
 - For example, industrial chillers? Large air conditioning units? Comfort cooling units?
 - What types of refrigerants are used? Is this a wide-ranging list or do you generally use a few specific types?
- Establish a baseline for full charge for potentially affected appliances
- Determine who is responsible for appliance maintenance and disposal
 - Are appliances managed by an outside contractor ***or*** is appliance maintenance/repair conducted using in-house technicians?
- For appliances with a full charge ≥ 50 lbs, establish a baseline leak rate
- Conduct an internal review of recordkeeping practices to determine compliance with the regulations
- ***For facilities with many potentially affected appliances*** – explore potential for developing a detailed refrigeration plan and refrigeration compliance system

REFRIGERANT MANAGEMENT REGULATIONS – AFFECTED REFRIGERANT TYPES

Refrigerant Type	Definition	Examples
Class I Refrigerants	Ozone-depleting substances classified as chlorofluorocarbons (CFCs).	CFC-11 (R-11) & CFC-12 (R-12)
Class II Refrigerants	Ozone-depleting substances classified as chlorofluorocarbons (HCFCs).	HCFC-22 (R-22)
Non-Exempt Refrigerants	Other, non-ozone depleting substances such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and hydrofluoroolefins (HFOs).	R-410a R-134a
Exempt Refrigerants	Refrigerants exempt from regulation under USEPA's refrigerant management regulations.	CO ₂ , N ₂ , or H ₂ O in any application; ammonia, chlorine, R-290, R-600a, R-170, or R-441A in limited applications

Regulatory Reference: 40 CFR 82.152

CASE STUDY #1

AM I SUBJECT TO THIS REGULATION?



Source: USEPA

CASE STUDY #1A - AM I SUBJECT THIS REGULATION?

- You have a relatively small pad-mounted air conditioning unit located at your facility. It contains **15 pounds** of **R-410a** at full charge.
 - Is this unit subject to any refrigerant management requirements?

Applicability Determination:

- The unit containing 15 pound of R-410a may be subject to some minor requirements. R-410a is a non-exempt, substitute refrigerant, and the full charge of the unit in question is > 5 pounds but < 50 pounds.
- This unit is subject to the following types of requirements:
 - General Applicability / Prohibitions
 - Proper Evacuation of Refrigerant from Appliances (specifically, recordkeeping)

CASE STUDY #1B - AM I SUBJECT THIS REGULATION?

- You have a relatively large industrial chiller located at your facility. It contains **60 pounds** of **ammonia** at full charge.
 - Is this unit subject to any refrigerant management requirements?

Applicability Determination:

- The unit containing 60 pounds of ammonia is **exempt** from all requirements under this regulation, as ammonia is an exempt substitute.

TECHNICIAN CERTIFICATION REQUIREMENTS

Former Requirements:

- Facilities were only required to utilize certified technicians to service appliances containing ODS refrigerants.

New Requirements:

- Facilities are required to utilize certified technicians to conduct all appliance maintenance, servicing, repair, leak inspection, and disposal work.
- As of **January 1, 2018**, only certified technicians can perform these tasks on appliances containing **any refrigerant type (except exempt refrigerants)**.
 - Technicians must be certified to the appropriate level (refer to table on next slide).

Regulatory Reference: 40 CFR 82.161(a)(1)

- Technician certification programs will be updated but technicians who are currently certified will not be impacted. There is no need to update previous certifications.

Regulatory Reference: USEPA Webinar on Rule Change (2016)

CASE STUDY #2

APPLIANCE DISPOSAL REQUIREMENTS

CASE STUDY #2A – APPLIANCE DISPOSAL REQUIREMENTS

- You have a relatively small pad-mounted air conditioning unit located at your facility. It contains **15 pounds** of **R-410a** at full charge.
 - Are you currently (circa 2017) required to keep any records with regards to appliance disposal if you employ a **third-party service provider (certified technician)** to dispose of the appliance?

Applicability Determination:

- No – more stringent recordkeeping requirements for disposal of appliances containing between 5 and 50 pounds of refrigerant do not come into effect until January 1, 2018.
- Even at that time, this recordkeeping burden falls on the **certified technician, not** the owner/operator

CASE STUDY #2B – APPLIANCE DISPOSAL REQUIREMENTS

- You have a relatively small pad-mounted air conditioning unit located at your facility. It contains **15 pounds** of **R-410a** at full charge.
 - Are you currently (circa 2017) required to keep any records with regards to appliance disposal if you have a **certified technician on-site** as part of your staff who disposes of the appliance?

Applicability Determination:

- No – more stringent recordkeeping requirements for disposal of appliances containing between 5 and 50 pounds of refrigerant do not come into effect until January 1, 2018.
- However, at that time, this recordkeeping burden falls on the **certified technician**. Therefore, you would be required to keep these records starting in 2018.

CASE STUDY #2C – APPLIANCE DISPOSAL REQUIREMENTS

- You have a large industrial chiller located at your facility. It contains **145 pounds** of **R-410a** at full charge.
 - Are you required to keep any records with regards to appliance disposal if you employ a third-party service provider (certified technician) to dispose of the appliance?

Applicability Determination:

- If the unit contains greater than or equal to 50 pounds of refrigerant, the **owner/operator** would be responsible for keeping records of appliance disposal. These records include:
 - Appliance identity and location; Date of disposal and type of disposal actions; Part of appliance being disposed; Amount and type of refrigerant removed from the appliance prior to disposal; Full charge of the appliance; and Name of person conducting disposal.
- Certified technicians conducting such disposal work should provide these records to the owner/operator at the conclusion of appliance disposal.

KEY CHANGE – REDUCTIONS TO APPLICABLE LEAK RATES

Source: USEPA - EnergyStar



Source: USEPA

Summary - Leak Rate Thresholds for Appliances with Full Charge \geq 50 LBS per Circuit

Category	Before January 1, 2019*	On and After January 1, 2019*
Industrial Process Refrigeration Equipment	35%	30%
Commercial Process Refrigeration Equipment	35%	20%
Comfort Cooling	15%	10%
Other Appliances	N/A – This was not a previously regulated appliance category.	10%
<i>Regulatory Reference</i>	<i>40 CFR 82.156(i)</i>	<i>40 CFR 82.157(c)</i>

* Leak rate calculated as the percentage of refrigerant that would be lost over a rolling 12-month period as compared to the appliance's full charge.

KEY CHANGE – VERIFICATION TESTS AND LEAK INSPECTIONS

Summary of Verification Tests and Leak Inspection Requirements for Appliances with Full Charge ≥ 50 lbs at Full Charge

Action	Frequency / Timing
Appliance Repair (Initial Attempt)	<ul style="list-style-type: none">• Within 30 days of leak discovery above applicable leak rate <i>[Regulatory Reference: 40 CFR 82.157(d)(1)]</i>• As many repairs as necessary to bring leaks below leak rate are allowed <i>[Regulatory Reference: 40 CFR 82.157(d)(2) & 40 CFR 82.157(e)(2)]</i>
Initial Verification Test	<ul style="list-style-type: none">• Within 30 days of leak discovery above applicable leak rate <i>[Regulatory Reference: 40 CFR 82.157(e)(1)]</i>• As many tests as necessary may be conducted to demonstrate successful repairs <i>[Regulatory Reference: 40 CFR 82.157(e)(1)]</i>
Follow-Up Verification Test	<ul style="list-style-type: none">• Within 10 days of a successful initial verification test <i>[Regulatory Reference: 40 CFR 82.157(e)(2)]</i>• Must demonstrate that leaks have been repaired (i.e., leaks below leak rate) <i>[Regulatory Reference: 40 CFR 82.157(e)(2)]</i>
Periodic Leak Inspections	<ul style="list-style-type: none">• Once per year for most types of appliances <i>[Regulatory Reference: 40 CFR 82.157(j)(1) & 40 CFR 82.157(g)(1)]</i>• Periodic leak inspections <u>are not required</u> until an appliance exhibits leaks above the applicable leak rate threshold <i>[Regulatory Reference: 40 CFR 82.157(g)(1)]</i>

CASE STUDY #3

AM I SUBJECT TO APPLIANCE MAINTENANCE AND LEAK REPAIR REQUIREMENTS?

**PLEASE NOTE, APPLICABILITY IN THIS CASE STUDY IS ASSESSED AGAINST
POST-2019 REQUIREMENTS.*

CASE STUDY #3A - AM I SUBJECT TO APPLIANCE MAINTENANCE AND LEAK REPAIR REQUIREMENTS?

- You have a relatively small pad-mounted air conditioning unit located at your facility, containing **14.5 pounds** of **R-410a** at full charge.
 - Is that unit subject to appliance maintenance and leak repair requirements?

Applicability Determination:

- The unit is **not** subject to appliance maintenance and leak repair requirements. Full charge of the unit is less than the threshold (50 pounds).

CASE STUDY #3B - AM I SUBJECT TO APPLIANCE MAINTENANCE AND LEAK REPAIR REQUIREMENTS?

- You have an industrial chiller unit located at your facility, containing **60 pounds** of **R-410a** at full charge.

The unit was inspected by a certified technician and was found to be leaking at a calculated leak rate of **13%**.

- Are repairs required to be initiated?

Applicability Determination:

- The 60 pound unit containing R-410a would **not be subject** to the more stringent appliance maintenance and leak repair requirements because the calculated leak rate for this appliance (**13%**) is less than the applicable leak rate for **industrial process refrigeration equipment (30%)**.

CASE STUDY #3C - AM I SUBJECT TO LEAK REPAIR REQUIREMENTS?

- You have an industrial chiller unit located at your facility, containing **60 pounds** of **R-410a** at full charge.

The unit was inspected by a certified technician and was found to be leaking at a calculated leak rate of **43%**.

- Are repairs required to be initiated? What next steps are required, and when?

Applicability Determination:

- The 60 pound unit containing R-410 would be subject to appliance maintenance and leak repair requirements, and repair actions are necessary to demonstrate compliance with rule requirements. Specifically, the following actions must be taken:
 - Appliance repair (initial attempt) is required within 30 days;
 - Conduct an initial verification test (within 30 days of leak discovery) and a follow-up verification test (within 10 days of successful initial verification test);
 - Conduct one periodic leak inspection per year until the leak rates are not exceeded for a year (required frequency for industrial process refrigeration equipment with a full charge ≥ 50 lbs but < 500 lbs); and
 - Develop a retrofit and/or retirement plan if continued repair attempts are unsuccessful.

APPLIANCE LEAK REPAIR – CHRONIC LEAKERS

Former Requirements:

- There were previously **no** requirements related to chronically-leaking appliances (this term was not previously defined)

New Requirements:

- Starting **January 1, 2019**, owners or operators of appliances containing 50 pounds or more of refrigerant leaking 125% or more of the full charge in a calendar year:
 - Must submit a report to EPA by **March 1** of the subsequent year describing efforts to identify leaks and repair the appliance

Regulatory Reference: 40 CFR 82.157(j)

"The earliest chronically leaking appliance report would be due March 1, 2020, and cover calendar year 2019"

– Correspondence with USEPA in December 2016

KEY TAKEAWAYS FROM REGULATORY CHANGES

- New requirements apply to all appliances containing greater than or equal to 50 lbs of refrigerant at full charge. However, some new requirements only apply to other appliance types (i.e., “small” and “medium” appliances based on full charge).
- Affected refrigerants have been expanded to include Class I and Class II refrigerants (previously regulated) as well as non-exempt substitutes (not previously regulated).
- As of **January 1, 2018**, maintenance, servicing, repair, and disposal of all appliances containing either Class I, Class II, and non-exempt refrigerant types must now be conducted by a certified technician.
- New leak rate thresholds have been approved for IPR, commercial refrigeration, and comfort cooling, and other appliance classes.
- There are new, more stringent requirements related to leak repair verification inspections, periodic appliance inspections, and appliances that are classified as “chronic leakers.”
- Facilities must keep record of invoices (including amount of refrigerants added), results of leak inspections, and results of verification tests as provided by certified technicians.
- ***Important to note:*** Although the requirement to conduct these actions may fall to your outside technicians, USEPA specifically points out that the ultimate burden for demonstrating compliance falls to **the owner/operator, not the technician.**

SUMMARY TABLE – CHANGES TO REFRIGERANT MANAGEMENT REQUIREMENTS

Action / Topic Area	Current Requirements	Brief Summary of Changes
<p>Affected Appliances</p>	<p>All appliances with a full charge of ≥50 lbs that contain either Class I or Class II refrigerants.</p>	<p>Affected refrigerants now include both ODS and other refrigerant types that are not exempt (e.g., ODS and/or HFCs).</p> <p>Majority of requirements apply to appliances with a full charge of ≥50 lbs.</p> <p>Minor requirements (recordkeeping) also apply to appliances with full charge less than 50 lbs.</p>
<p>Leak Rate Threshold*</p>	<ul style="list-style-type: none"> - Industrial Process Refrigeration = 35% - Commercial Refrigeration = 35% - Comfort Cooling = 15% - Other Appliances = N/A 	<ul style="list-style-type: none"> - Industrial Process Refrigeration = 30% - Commercial Refrigeration = 20% - Comfort Cooling = 10% - Other Appliances = 10%
<p>Repair Verification*</p>	<p>Repair leaks within 30 days such that the leak rate is brought below the leak rate threshold.</p> <p>No requirement to conduct quarterly or annual leak inspections after repair</p>	<p>Repair leaks within 30 days such that the leak rate is brought below the leak rate threshold.</p> <p>Conduct periodic leak inspection following repair of identified leaks at required intervals based on full charge.</p>

* Requirements apply to appliances with full charge ≥50 lbs of non-exempt refrigerant.

Source: USEPA Presentation on regulatory changes (2016)

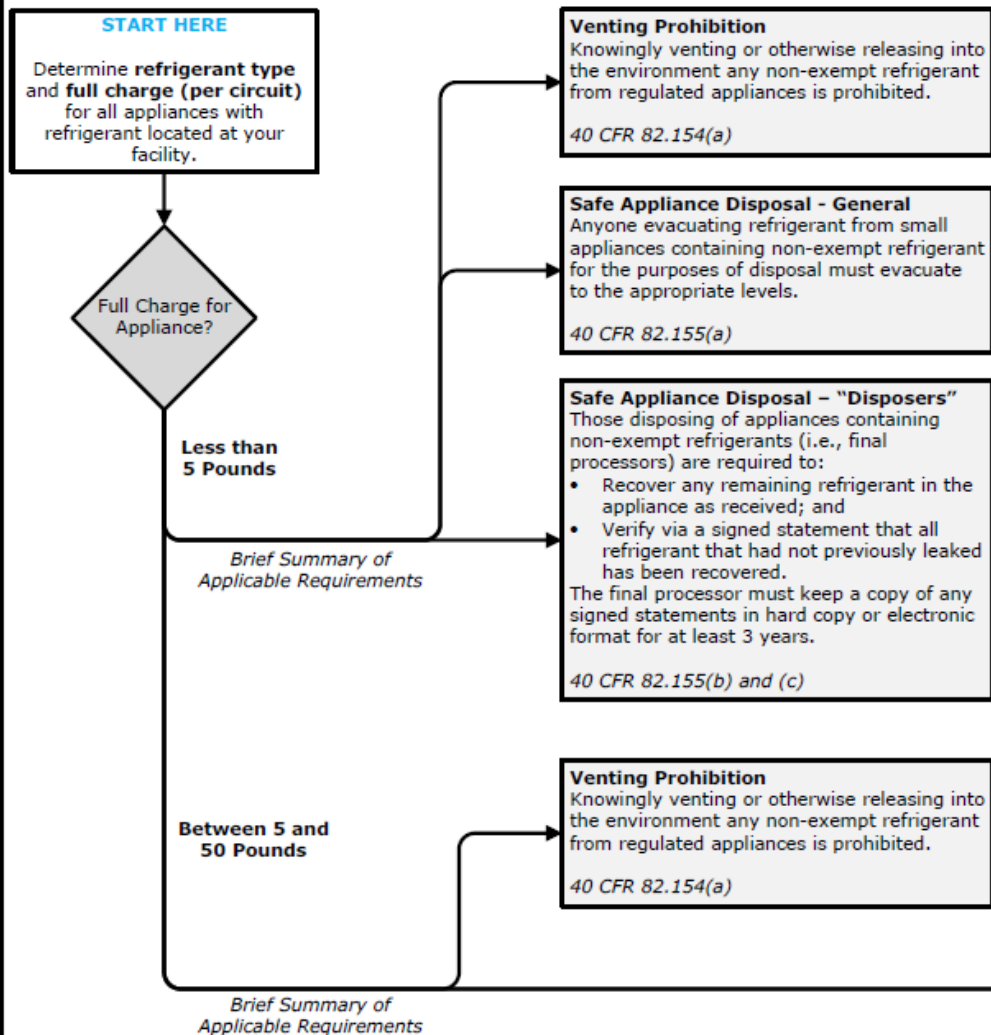
SUMMARY TABLE – CHANGES TO REFRIGERANT MANAGEMENT REQUIREMENTS

Action / Topic Area	Current Requirements	Brief Summary of Changes
<p>When Leak Rate Exceeds Applicable Trigger Rate*</p>	<p>Initial and follow-up verification tests required for Industrial Process Refrigeration and federally-owned appliances only.</p> <p>Established a required 30-day window to perform follow-up verification tests.</p>	<p>Initial and follow-up verification tests required for all affected appliances that exceed the applicable leak rate. The window for follow-up verification tests has been shortened to 10 days.</p> <p>Periodic leak inspections are required for specific appliance types that demonstrate leaks above leak rate thresholds; not required for appliances equipped with automatic leak detection systems.</p>
<p>Failure to Repair Leaks within 30 Days*</p>	<p>A retrofit/retirement plan is required.</p>	<p>Unchanged</p>
<p>Required Timeline for Retrofit/Retirement Plans*</p>	<p>Appliance must be retrofitted or retired within one year.</p>	<p>Unchanged</p>
<p>Extensions to 30-day Repair Timeline*</p>	<p>Allowed under specific circumstances dictated by the type of appliance and whether the appliance is federally-owned.</p>	<p>Previously allowed only for industrial process refrigeration appliances; now allowed for all appliance types under specific circumstances.</p>

* Requirements apply to appliances with full charge ≥50 lbs of non-exempt refrigerant.

Source: USEPA Presentation on regulatory changes (2016)

**Flowchart 1
Appliance Disposal and Refrigerant Evacuation
(Appliances Containing < 50 LBS of Refrigerant)
Post-2018 Regulatory Requirements^{1,2}
[40 CFR 82.155, 40 CFR 82.156]**



Footnotes:

¹ Requirements related to required evacuation levels for specific equipment types, certification requirements for recovery and/or recycling equipment, and recordkeeping and reporting requirements have not been included here. (No requirements for required evac levels, recovery / recycling equipment, etc. have been included). Ramboll can provide a summary of these detailed requirements upon specific request.

² Please note, the requirements included herein do not reflect the full scope of potentially applicable requirements (i.e., detailed recordkeeping and/or reporting) that could apply. For more detail, please refer to 40 CFR 82, Subpart F.

**Flowchart 2
Technician Certification Requirements
Post-2018 Regulatory Requirements
[40 CFR 82.161]**

Brief Summary of Requirements Related to Certified Technicians:

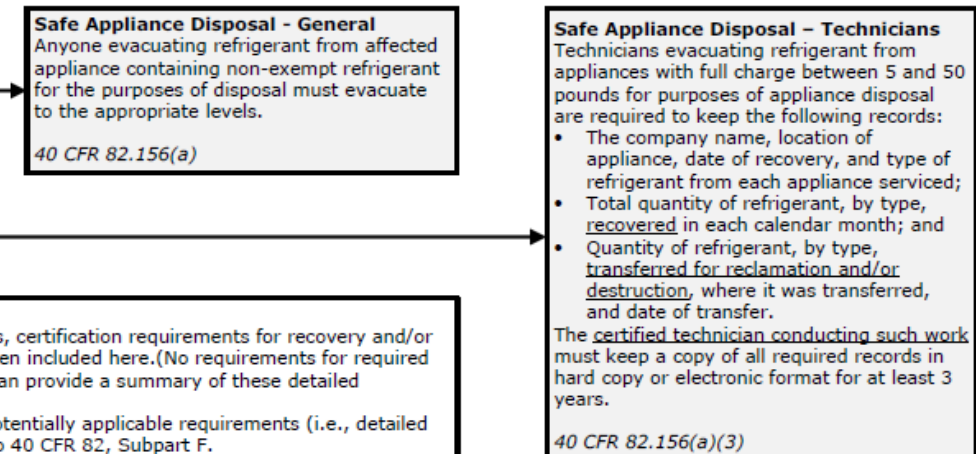
- All facilities are required to utilize certified technicians to conduct all appliance maintenance, servicing, repair, leak inspection, and appliance disposal work. This is for all appliances containing non-exempt substitute refrigerants regardless of full charge.
- Technicians must be certified to the appropriate level (refer to the below table).
- While USEPA's certification programs will be updated, technicians currently certified will not be impacted (i.e., previous certification do not need to be updated).
- Technicians must keep a copy of the certificate at their place of business.

40 CFR 161(a)(1)-(a)(4)

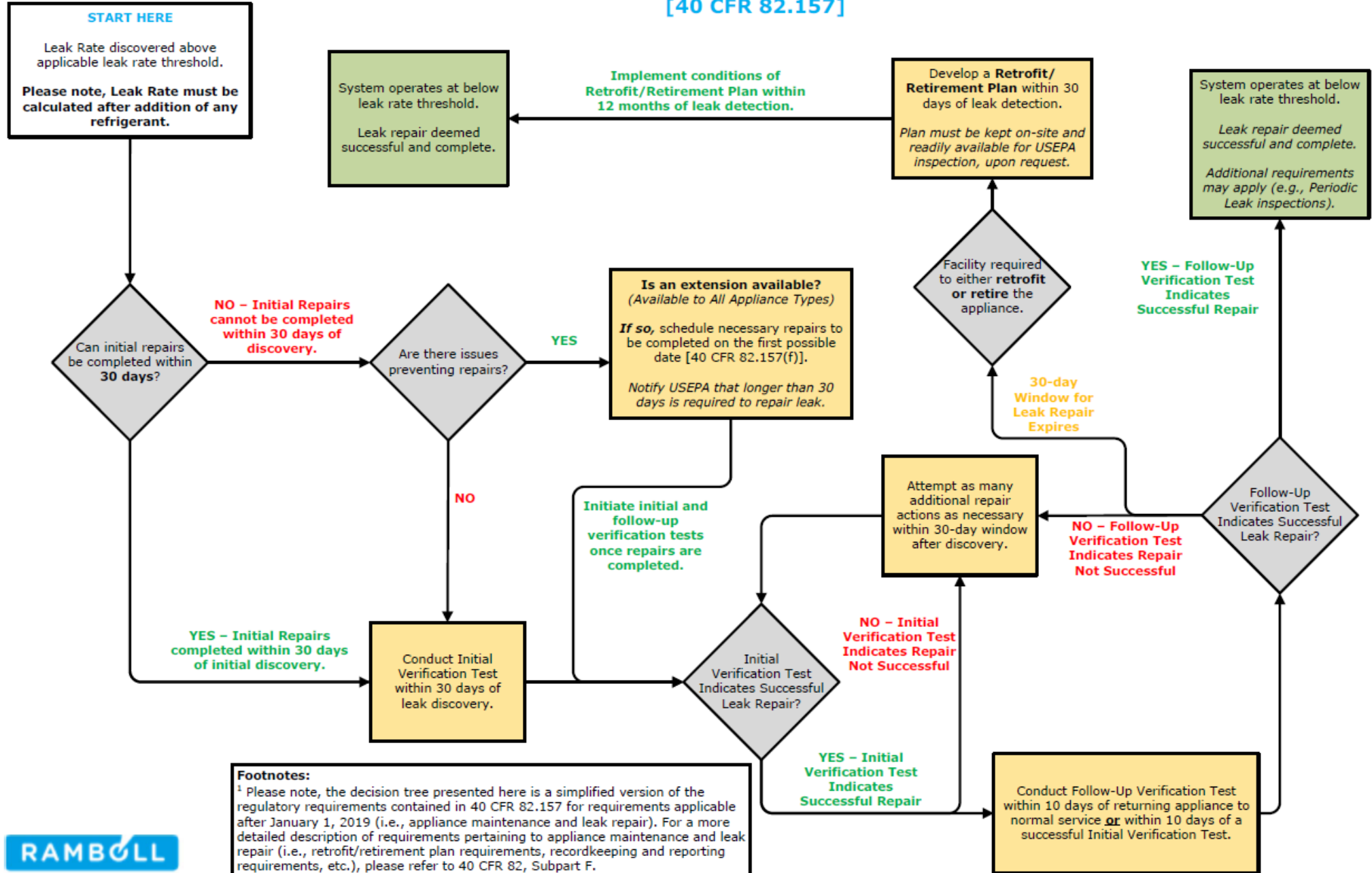
Summary – Technician Certification Standards (Required Certification Types)

Appliance Category	Required Certification Type	Regulatory Reference
Small Appliances (≤ 5 lbs Charge)	Type I Technician	40 CFR 82.161(a)(1)(i)
Low-Pressure Appliances	Type III Technician	40 CFR 82.161(a)(1)(iii)
Medium-Pressure Appliances	Type II Technician	40 CFR 82.161(a)(1)(ii)
High-Pressure Appliances	Type II Technician	40 CFR 82.161(a)(1)(ii)
Very High-Pressure Appliances	Type II Technician	40 CFR 82.161(a)(1)(ii)

* It is important to note, persons who maintain, service, repair, or dispose of **all** appliance types can do so while certified as a **Universal Technician** [40 CFR 82.161(a)(1)(iv)].



FLOWCHART Appliance Leak Detection and Repair Timeline Post-2019 Regulatory Requirements ¹ [40 CFR 82.157]



Footnotes:
¹ Please note, the decision tree presented here is a simplified version of the regulatory requirements contained in 40 CFR 82.157 for requirements applicable after January 1, 2019 (i.e., appliance maintenance and leak repair). For a more detailed description of requirements pertaining to appliance maintenance and leak repair (i.e., retrofit/retirement plan requirements, recordkeeping and reporting requirements, etc.), please refer to 40 CFR 82, Subpart F.



QUESTIONS?

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