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Title:	**Refrigerant Management Program**	**Number:**	12-50.902.CGENV
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Sponsor:	Jeff Werwie Jeff.Werwie@jci.com	**Revision:**	03 January 30, 2012

1 PURPOSE

The purpose of this Standard is to identify the requirements for managing refrigerants when Johnson Controls services and maintains refrigerant systems. Johnson Controls follows this Standard in compliance with Section 608 of the 1990 Clean Air Amendments and 40 Code of Federal Regulations [CFR] 82, Subpart F.

This Standard describes the program that applies to all certified personnel who handle, recycle, and control refrigerant and compressor oil using approved equipment and who service, decommission, or dispose of refrigerant systems

2 SCOPE

	Asia	EMEA	Japan	Americas	Compliance expected as written	Can be tailored to local needs	Specific Applicability / Variance / Exceptions
BEHQ				X			SSA Service Mechanics should use a Service Work Order (Ticket). If SS O&M and SS FM sites are using SS truck-based service, then use Service Work Order from the Branch If self-performing, use this Standard.
GWS				X			
JCFS				X			
GTM				X			
SS				X			

3 SUMMARY OF CHANGES

3.1 Initial release of a new C-BOS document on May 16, 2005. Previously published on the Environmental Management System portion of the Johnson Controls Legal Connection website, as EMS 4.4.6.19 dated 03-25-05.

- 03-24-06 Format changes from previous version
- 01-30-12 Format changes from previous version

4 RESPONSIBILITIES

4.1 **Technicians & Mechanics:** Ensure that they adhere to all refrigerant management, repair, service, and maintenance practices. Technicians and Mechanics are responsible for becoming certified by an EPA-approved certification organization. Technicians and Mechanics are prohibited from intentionally or knowingly venting or releasing refrigerant into the atmosphere.

4.2 **Subcontractors:** Adhere to Johnson Controls Safety and Environmental Processes and Standards. Subcontractors providing maintenance, service or repair on equipment that contains refrigerant must become certified by an EPA-approved certification organization. Also, subcontractors are prohibited form intentionally or knowingly venting or releasing refrigerant into the atmosphere.

4.3 **Service Team Supervisor (STS):** Ensuring that all Johnson Controls employees adhere to the "Refrigerant Management Program" Standard. STSs must ensure that all technicians and mechanics involved with refrigerant management are certified by an EPA-approved organization, that EPA-approved refrigerant recovery equipment is readily available, that leak rate calculations are done properly, and that records are kept to document repairs, maintenance, service, and refrigerant management.

4.4 **Site Operations Supervisor:** Oversees the entire refrigerant management program. The Site Operations Supervisor will conduct periodic self-inspection audits to ensure compliance with the program and any EPA or state regulations. The Site Operations Manager will communicate changes in refrigerant regulations and be the contact for all communications with environmental agency authorities

5 DEFINITIONS

5.1 Appliance - any device that contains and uses a Class I (CFC) or Class II (HCFC) substance as a refrigerant and that is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer. The U.S. Environmental Protection Agency (EPA) interprets this definition to include all air-conditioning and refrigeration equipment except that designed and used exclusively for military purposes.

5.2 CFCs - chlorofluorocarbons. These are Class I Ozone Depleting Substances that have an ozone-depletion potential of 0.2 or greater. Examples include R-11, R-12, and R-113.

5.3 Commercial Refrigeration – refrigeration appliances used in the retail food and cold storage machines. Retail food includes the refrigeration equipment found in supermarkets, convenience stores, and restaurants. Cold storage includes the equipment used to store meat, produce, dairy products, and other perishable goods. Full charges are typically greater than 75 pounds.

5.4 Full Charge - the amount of refrigerant required for normal operating characteristics or conditions of a refrigerant system.

5.5 HCFCs - hydrochlorofluorocarbons. These are Class II Ozone Depleting Substances that have an ozone-depletion potential of less than 0.2. Examples include R-22.

5.6 High Pressure Refrigerant - refrigerant with a boiling point between -50 degrees Fahrenheit and 10 degrees Fahrenheit. This would include but not be limited to R-12, 22, 114, 500, 502.

5.7 Industrial Process Refrigeration - refrigeration systems that are directly linked to an industrial process.

5.8 Leak Rate - a percentage calculated by multiplying by 100 the ratio of the pounds of refrigerant added to a system to the pounds of full charge of that system multiplied by the ratio of 365 days to the shorter of: 365 days or number of days since the refrigerant was last added.

5.9 Low Pressure Refrigerant - refrigerant with a boiling point greater than 10 degrees Fahrenheit. This would include but not be limited to R-11, 113, 123.

5.10 MVAC - any appliance that is a motor vehicle air conditioner as defined in 40 CFR part 82, subpart B.

5.11 MVAC-Like Appliance - mechanical vapor compression, open-drive compressor appliances used to cool the driver's or passenger's compartment of a non-road motor vehicle. This includes the air-conditioning equipment found on agricultural or construction vehicles. This definition does not cover appliances using HCFC-22 refrigerant.

5.12 ODS – ozone-depleting substances.

5.13 Refrigerant System - any device or process that uses a refrigerant to remove heat from an environment or process. This will include any air conditioner, refrigerator, chiller, freezer, etc. and any type of cooling equipment that uses a CFC, HCFC or substitute.

5.14 Refrigerant - CFCs, HCFCs, and substitutes that are utilized in the cooling process due to their thermodynamic property to economically absorb heat during the vaporization process.

5.15 Refrigerant Substitute - chemicals used in place of CFCs and HCFCs to accomplish heat removal in a refrigerant system.

5.16 Technician - any person who performs maintenance, service, or repair that could reasonably be expected to release Class I (CFC) or Class II (HCFC) substances from appliances, except for MVACs, into the atmosphere. Technician also means any person performing disposal of appliances, except small appliances, MVACs, and MVAC-like appliances that could be reasonably expected to release Class I or Class II refrigerants into the atmosphere.

5.17 Trigger Rate - the leak rate above which leak repair, retrofit, or retirement requirements are applicable.

5.18 Very High Pressure Refrigerant - refrigerant with a boiling point less than -50 degrees Fahrenheit. This would include but not be limited to R-13, 503.

6 RELATED DOCUMENTS

6.1 Environmental Policy #12-50.101.CGENV.

6.2 Code of Federal Regulations 40 CFR Part 82

7 STANDARD PRACTICES

7.1 Venting Restrictions:

7.1.1 Individuals may not knowingly vent ozone-depleting compounds used as refrigerants into the atmosphere while maintaining, servicing, repairing, or disposing of air-conditioning or refrigeration equipment. There are four types of exceptions to this rule as follows:

7.1.1.1 De minimis" quantities of refrigerant released in the course of making good faith attempts to recapture and recycle or safely dispose of refrigerant.

7.1.1.2 Refrigerants emitted in the course of normal operation of air conditioning and refrigeration, such as purging and leaks. However, EPA requires the repair of leaks above a certain size.

7.1.1.3 Releases of CFCs, HCFCs, HFCs, and PFCs that are not used as refrigerants. For instance, mixtures of nitrogen and R22 that are used as holding charges or as leak test gases may be released.

7.1.1.4 Small releases of refrigerant that may result from purging hoses or from connecting or disconnecting hoses to charge or service equipment (appliances).

7.2 Evacuation Requirements

7.2.1 When opening the equipment, technicians are required to evacuate air-conditioning and refrigeration equipment to establish vacuum levels. The required vacuum level varies depending on the age of the equipment and the size of the refrigerant system. The evacuation requirements are provided in Tables 1 and 2.

TABLE 1

Type of Appliance	Inches of Mercury Vacuum* Using:	
	Equipment Manufactured Before Nov. 15, 1993	**Equipment Manufactured On or After Nov. 15, 1993**
HCFC-22 appliance** normally containing less than 200 pounds of refrigerant	0	0
HCFC-22 appliance** normally containing 200 pounds or more of refrigerant	4	10
Other high pressure appliances** normally containing less than 200 pounds of refrigerant (CFC-12, -500, -502, -114)	4	10
Other high pressure appliances** normally containing 200 pounds or more of refrigerant (CFC-12, -500, -502, -114)	4	15
Very High Pressure Systems (CFC-13, -503)	0	0
Low Pressure Systems (CFC-11, HCFC-123)	25	25 mm Hg absolute

*Relative to standard atmospheric pressure of 29.9" Hg.
**Or isolated component of such an appliance

TABLE 2

Type of Appliance	Percentage of Refrigerant That Must be Recovered When:	
	Using Equipment Manufactured Before Nov. 15, 1993 OR When The Compressor in the Appliance is Not Operating	**Using Equipment Manufactured On or After Nov. 15, 1993 AND the Compressor in the Appliance is Operating**
Small Refrigerant Systems with a charge of 5 pounds or less (small refrigerators, window air conditioners, water coolers, etc.)	80%	90%

7.2.2 Technicians must use the recovery equipment according to the directions of its manufacturer.

7.2.3 For small refrigerant systems, technicians must satisfy recovery requirements by evacuating the system to four inches of mercury vacuum.

7.2.4 Persons who simply add refrigerant to top-off appliances are not required to evacuate the systems.

7.2.5 All evacuations must be documented on a service ticket.

7.3 Evacuation Exceptions

7.3.1 **Exceptions for Leaky Equipment:** If, due to leaks, a technician cannot evacuate a system to the required levels or evacuation would substantially contaminate the refrigerant being removed, the technician must do the following: (1) isolate the leaking component(s) from the non-leaking component(s) wherever possible; (2) evacuate the non-leaking component(s) to the required levels; and (3) evacuate the leaking component(s) to the lowest level attainable without substantially contaminating the refrigerant but not to a level exceeding 0 psig.

7.3.2 **Exception for Minor Repairs:** If repairs are minor and do not require evacuation of the equipment to the environment, the technician must evacuate high or very high pressure systems to at least 0 psig. Low-pressure systems must be evacuated to 0 psig before these systems are opened. Methods that require subsequent purging can only be used with appliances containing R-113.

7.4 Reclamation Requirements

7.4.1 Refrigerants are not subject to restrictions if they are recovered and/or recycled and are returned to a system owned by the same party that owned the original system.

7.4.2 If a refrigerant changes ownership, it must be reclaimed unless it was used only in a MVAC or MVAC-like appliance and will be used in the same type of appliance.

7.5 Refrigerant Addition Requirements

7.5.1 Service providers must keep records of all additions of refrigerant-to-refrigerant systems, regardless of system size or refrigerant type.

7.5.2 Technicians must weigh each individual addition separately using a calibrated scale.

7.6 Oil Change Requirements

7.6.1 Prior to an oil change, technicians must reduce the pressure in a refrigeration system. This ensures recovery of the bulk of the refrigerant contained in the oil. The technician must reduce the pressure to less than 5 psig.

7.6.2 There are two acceptable methods for the recovery of refrigerant contained in oil:

7.6.2.1 Evacuating (or pressurizing) the refrigeration appliance or isolated portion to a pressure no greater than 5 psig and then removing the oil; or

7.6.2.2 Draining the oil into a system receiver to be evacuated (or pressurized) to a pressure no greater than 5 psig.

7.7 Refrigerant Leaks

7.7.1 The Refrigerant Leak Rate Determination Spreadsheet must be used to track refrigerant system leaks. Refer to the Johnson Controls Environmental Compliance web page for the Excel file containing additional instructions and the standard leak rate spreadsheet.

7.7.2 There will be one spreadsheet for each piece of equipment that has a capacity greater than 50 pounds of refrigerant. Each spreadsheet must contain the name of the equipment manufacturer, model, serial number, charge capacity, refrigerant type.

TABLE 3

Activity	Certified Technician Required	
	YES	NO
Evacuating Refrigerant	X	
Adding Refrigerant	X	
Adding or Changing Oil	X	
Replacing Gages	X	
Changing or Calibrating a DP Cell	X	
Changing a Pressure Relief Valve	X	
Sampling Refrigerant or Oil	X	
System Dismantle, if Release Possible	X	
Any of above, Performed under Direct Supervision of a Certified Technician	X	
Fixing Leaks by Tightening Nuts or Bolts		X
Activities on Evacuated Systems		X

7.8 Leak Rate Calculation

7.8.1 Every time refrigerant is added to a refrigerant system (a system that has a full charge capacity more than 50 pounds), the technician must conduct a leak rate calculation to determine whether the leak rate is higher than the trigger rate. The calculation can be done automatically by entering the amount of refrigerant added into the system and the date of service into the “Leak Rate Determination Spreadsheet”.

7.8.2 The leak rate can also be derived by calculating the ratio of the number of pounds of refrigerant added to bring the system to full charge to the number of pounds of full charge. This result is then multiplied by the ratio of 365 days to the shorter of: 365 days or number of days since refrigerant was last added. The leak rate percentage is then determined by multiplying this result by 100. The following is the formula for calculating leak rate percentage. It provides the percentage of full charge that would leak out in a 12-month period.

$$\textbf{Leak Rate \%} = \frac{\text{Pounds of refrigerant added}}{\text{Pounds of full charge}} \times \frac{\text{365 days}}{\text{shorter of: 365 days or number of days since refrigerant was last added}} \times 100$$

7.9 Trigger Rate Chart

7.9.1 Function of equipment, and location. Most leak rate repairs must be performed by a certified technician. See Table 3 – Certified Technician required for a representative listing of operation and repair activities and the associated need for certified or non-certified technicians

7.9.2 Further action is required when the calculated leak rate exceeds the stipulated percentages for the equipment types shown in Table 4:

7.9.3 Equipment that contains less than 50 pounds of refrigerant will not be monitored for leak rate calculations.

TABLE 4

Equipment	Trigger Leak Rate
Industrial Process Refrigeration	35%
Commercial Process Refrigeration	35%
Comfort Cooling	15%
All Other Appliances	15%

7.10 Determination of a Full Charge

7.10.1 A full charge is the quantity of refrigerant needed to operate at normal operating conditions and characteristics. Knowledge of the full charge amount is necessary to determine if the equipment holds greater than 50 pounds of refrigerant. If so, the figure is needed to calculate leak rates.

7.10.2 Five methods are acceptable for determination of the full charge amount.

7.10.2.1 Manufacturer's data – Some manufacturers will specify the full charge amount for its equipment. The information may be contained in a plate affixed to the equipment or in equipment specifications provided by the vendor.

7.10.2.2 Calculation of the Quantity – The full charge amount may be calculated knowing the volume of space occupied by the refrigerant and the density of the refrigerant.

7.10.2.3 Actual Measurement – The refrigerant can be evacuated from the equipment and weighed, or the weight of material added to an empty system to attain full charge can be measured.

7.10.2.4 Establish Range – Based on best available data during normal operating conditions and characteristics, the mid-point of an established range can serve as the full charge amount.

7.10.2.5 Combinations of the above four methods.

7.11 Required Leak Repair

7.11.1 Decision and activity flowcharts for industrial process refrigeration and federally-owned chillers and commercial refrigeration and comfort cooling are available to assist those responsible for managing refrigerant leaks. The flow charts are designed to identify critical action items, determine applicable requirements, and regulatory deadlines for leak repairs. These flow charts should be used in conjunction with the following information.

7.11.2 Should the results of the leak check calculation indicate a leak rate in excess of the trigger rate, specific actions are required to be undertaken. Generally, leaks must be repaired within 30 days of discovery. If that is not possible, a retrofit/retirement plan must be developed within 30 days of leak discovery and acted upon within one year. The plan must be kept on-site readily available for EPA inspection**; submission of the plan to EPA is not required**.

7.11.3 An extension of time beyond 30 days to repair a leak may be requested from EPA through submission of reasons for the delay and the estimated time of completion are required.

7.11.4 A sample letter requesting an extension from the U.S. EPA is available. Additional time may be requested beyond that if the request to EPA is made within 30 days of discovery of the need for such a change along with the submission of reasons and a new completion date. For industrial process refrigeration and federally owned chillers, additional time to **repair a leak** may be available as follows:

7.11.4.1 If a process shutdown is required to repair a leak from industrial process refrigeration, up to 120 days is allowed to make the repair; however, development of a retrofit/retirement plan within 30 days of leak discovery is still required.

7.11.4.2 When the necessary parts to make the repair are unavailable within the 30/120-day period.

7.11.4.3 Applicable federal, state, or local regulations make the repair impossible within the 30/120-day period.

7.11.5 In addition, verification checks to prove the **leak repair** was successful (i.e., the repaired leak rate is below the trigger percentages) are required for industrial process refrigeration and federally owned chillers. Refer to Verification Test Types and Methods section.

7.11.6 Details of the **retrofit/retirement** plans are discussed in the Retrofit and Retirement Requirements section

7.11.7 The requirement to repair leaks is waived if the equipment is mothballed. To be mothballed, the equipment must be shutdown for an extended period, and the refrigerant must be evacuated from the appliance or the affected isolated section of the appliance to at least atmospheric pressure.

7.11.8 A memo to customers identifying equipment with excessive leaks should be sent to each applicable customer is available. The purpose of this sample memo is to inform customers that they have equipment with leak rates exceeding the threshold requirement for repair and that Johnson Controls has opened a work order to make the repairs.

7.11.9 The leak repair log sheet is available and must be completed for appliances normally containing 50 pounds with a leak rate in excess of trigger quantities.

7.12 Verification Test Types and Methods

7.12.1 Verification testing is required after repairs have been completed to industrial process refrigeration and federally owned chillers to confirm the repairs were successful. Success is defined as the leak rate after repair is below the 35% annualized leak rate trigger.

7.12.2 An initial test must be performed after the repair of the leak and before replacement of the full charge of refrigerant. An exception is if a decision is made to retrofit or retire rather than repair the leak. If the system has not been evacuated to make the repair, an initial test is still required and must be conducted as soon as feasible after the repair work is completed.

7.12.3 A follow-up verification test is required:

7.12.3.1 Within 30 days after the initial verification test where normal operating conditions or characteristics have been maintained; or

7.12.3.2 Within 30 days of bringing the system back on-line if taken off-line and where the system is operating at normal operating conditions or characteristics.

7.12.4 The regulations do not specify approved test methods for the verification testing. EPA allows sound professional judgment to be employed to select appropriate test methods. Examples include the following:

7.12.4.1 Soap bubble test

7.12.4.2 Electronic leak detectors

7.12.4.3 Ultrasonic leak detectors

7.12.4.4 Pressure test

7.12.4.5 Vacuum test

7.12.4.6 Fluorescent dye or black light test

7.12.4.7 Infrared test

7.12.4.8 Near infrared test

7.12.4.9 Halon refrigerant gas detection

7.13 Retrofit and Retirement Requirements

7.13.1 A decision and activity flow chart for retrofit and retirement associated with commercial refrigeration, industrial refrigeration, and comfort cooling process is available. This flow chart is designed to identify critical action items, determine applicable requirements, and site regulatory deadlines for leaks greater than trigger levels. This flow chart should be used in conjunction with the following information.

7.13.2 The requirement to repair a leak is waived if a retrofit/retirement plan is developed, implemented, and completed. To qualify for retrofit/retirement, all of the following must be met:

7.13.2.1 The plan must be developed within 30 days of discovery of the leak. (Submission of the plan to EPA is not required.)

7.13.2.2 A copy of the plan must be kept on-site.

7.13.2.3 The plan must be dated.

7.13.2.4 The original must be made available for EPA review upon request.

7.13.2.5 The retrofit/retirement plan must be completely implemented within 12 months of the date of the plan.

7.13.3 For industrial process refrigeration and federally owned chillers, an extension of the 12-month period for a **retrofit/retirement** plan may be granted if a request to EPA is made within 6 months from the expiration of the initial 30 day period under any of the following circumstances:

7.13.3.1 Federal, state, or local regulations prevent fulfilling the plan requirements within one year. A reasonable extension may be permitted.

7.13.3.2 A suitable refrigerant replacement is not available.

7.13.3.3 The refrigeration equipment is custom built and the supplier has quoted a delivery time of more than 30 weeks after a timely order was placed. A 12-month extension may be arranged under these circumstances. Further, additional time may be granted beyond the extra year if a request is made by the end of the ninth month of the extra year.

7.13.4 An industrial process shutdown does not extend the deadline to notify EPA that additional time is needed.

7.13.5 Relief from the requirement to retrofit or retire a system due to a failed follow-up verification test may be possible if:

7.13.5.1 A repair effort following the failed follow-up verification test is made within 30 days or 120 days when the repair requires a process shutdown and the subsequent initial and follow-up verification tests indicate success of the repair. However, EPA must be notified within 30 days of the completion of the follow-up verification test.

7.13.5.2 Within 180 days of a failed follow-up verification test associated with the initial repair effort, it is established that the leak rate is below the trigger leak rate. EPA must be notified of the result and methodology used within 30 days after that determination.

7.13.6 For federally owned commercial or comfort cooling appliances, an extension of the 12-month period may be granted to complete the retrofit or retirement under these following conditions:

7.13.6.1 Due to conditions with the federal agency appropriation and/or procurement process, a delivery time of more than 30 weeks from the beginning of the official procurement period is quoted.

7.13.6.2 The appliance is located in an area affected by radiological contamination and creating a safe work place will require more than 30 weeks.

7.13.6.3 EPA is notified of the need for an extension within six months after expiration of the 30-day period following discovery of an excessive leak. The notification must include a description of the affected appliance, why the extension is needed, and information per Leak Repair Log section.

7.13.7 For federally owned commercial or comfort cooling appliances, a request for an additional year extension may be submitted to the EPA before the end of the ninth month of the first 12-month extension. The request must include information per the Leak Repair Log section. If no response from EPA is received within 30 days of EPA's receipt of the request, the request is assumed to be approved.

7.14 Certifications:

7.14.1 Generally, any servicing or repair that could result in the release of refrigerant requires the use of certified equipment by certified technicians. This section discusses the types of necessary certifications.

7.14.2 Technician Certifications

7.14.2.1 Technicians are to be certified by an EPA approved program. Technicians may only work on equipment for which they are certified.

7.14.2.2 Johnson Controls technicians must have certification cards in their possession at all jobs. Branch Offices must keep copies of all certificates in their files.

7.14.3 Recovery and Recycling Equipment

7.14.3.1 All technicians will use only properly certified recovery and recycling equipment. EPA has prepared a form for certification (ATTACHMENT 4, Acquisition Form for **Fabricated Units**).

7.14.3.2 Equipment that has been damaged or modified must be recertified prior to reuse.

7.14.3.3 Johnson Controls Branch Offices are required to maintain records of:

- Model number
- Serial number
- Date of manufacturing
- Purchase date
- Manufacturer

7.14.4 Approved Organizations for Certification of Recycling and Recovery Equipment - The Air Conditioning and Refrigeration Institute (ARI) and Underwriters Laboratories (UL) has been approved by EPA to certify recycling and recovery equipment. Lists of certified equipment may be obtained by contracting ARI at 703-524-8800 and UL at 708-272-8800, ext. 42371

7.15 Handling and Storage Requirements - Refrigerants

7.15.1 Refrigerants are typically contained in cans or large cylinders. The containers must be properly labeled as to the contents and amount of refrigerant in the container.

7.15.2 Care must be taken to ensure the container is properly secured to prevent movement and tip over. The proper restraints will be available in service trucks and central storage areas.

7.15.3 Johnson Controls will provide training of the appropriate employees in the handling and storage of refrigerants.

7.15.4 Refrigerants are not to be mixed. Refer to Material Safety Data Sheets for additional safety information.

7.16 Refrigerant Purchases – Large Cylinders

7.16.1 Generally, purchases are allowed only by certified technicians. However, an uncertified purchaser may buy refrigerant if that person has a letter from Johnson Controls stating that a specific person (by name) at the particular shop or facility for which the purchase is made is certified, including a copy of the certification of that person. The shop must notify the seller when the person mentioned in the letter is no longer employed at the shop.

7.16.2 The buyer should request a copy of an invoice from the seller indicating the name of the buyer, the date of the transaction, and the quantity purchased.

7.17 Refrigerant Purchases - Cans

7.17.1 Cans may only be sold to certified technicians. The buyer should receive a copy of the invoice from the seller indicating the name of the buyer, the date of purchase, and the quantity purchased.

7.18 Inventory Tracking

7.18.1 Records are to be maintained to track inventories for each cylinder or can of refrigerant including the following:

7.18.1.1 Purchase data, vendor name, and invoice number

7.18.1.2 Quantity purchased/obtained

7.18.1.3 For a specific job

- Customer name and location
- Date of service
- Each appliance serviced
- Quantity dispensed and/or recovered for each appliance

- Full charge quantity of each appliance
- Technician servicing each appliance
- Balance of refrigerant quantity in cylinder or can
- Quantity of refrigerant added to each appliance by the owner since the last Johnson Controls service date

7.18.2 The Inventory/Service Record Log sheet is available and must be used to track the above information. Refer to the Johnson Controls environmental compliance web site for the Excel file containing this log sheet.

7.19 Equipment Disposal

7.19.1 All appliances Johnson Controls services for disposal shall be evacuated to the appropriate levels in Table 1 of this document by certified technicians using certified equipment. The refrigerant recovered is to be logged per the Inventory Tracking section above**.** The equipment evacuated is to be tagged indicating that refrigerant has been evacuated per EPA criteria.

7.20 Refrigerant Disposal

7.20.1 Refrigerant to be disposed should be sent to an EPA-certified reclaimer, where possible. Refrigerant treated in this manner will not be considered hazardous waste. If reclaim is not an option, the refrigerant must be handled as a hazardous waste per Resource Conservation and Recovery Act (RCRA) regulations. A list of certified reclaimers is available at www.epa.gov/ozone. An example disposal report to the customer to advice of the disposition of refrigerant in the equipment is available).

7.21 Oils Disposal

7.21.1 Used oils, where possible, are to be handled as follows:

7.21.1.1 They are not to be mixed with other waste.

7.21.1.2 They are to be subjected to CFC recycling or reclamation.

7.21.1.3 They are not to be mixed with other types of used oils.

7.21.1.4 Should these criteria be met, the oils would not need to be treated as hazardous waste under RCRA.

8 RECORDKEEPING AND REPORTING

8.1 Technician Certifications

8.1.1 Copies of technician certifications will be maintained in a file at each Johnson Controls service shop/facility.

8.2 Service Records

8.2.1 Records are to be maintained by each certified technician or mechanic for each service as follows:

8.2.1.1 Date of service

8.2.1.2 Customer and location

8.2.1.3 Certified technician name

8.2.1.4 For each appliance serviced

8.2.1.5 Name of appliance

8.2.1.6 Refrigerant types used

8.2.1.7 Quantity added or recovered

8.2.1.8 Type of service performed

8.2.1.9 Serial number of recycling/recovery equipment

8.2.2 An Inventory/Service Record Log sheet is available and will be used to maintain the refrigerant service record for customer appliances. Refer to the Johnson Controls Environmental Compliance web page for the Excel file containing this log sheet.

8.3 Leak Rate Calculations

8.3.1 As soon as possible after adding refrigerant to any appliances leak check rates are to be calculated, recorded and provided to the customer.

8.4 Leak Repair Logs

8.4.1 For small appliances, comfort cooling, commercial and industrial process refrigeration with calculated leak rates in excess of trigger rates, the following information is required to be recorded relative to leak repair:

8.4.1.1 Any repair work completed and the date the work was completed

8.4.1.2 If greater than 30 days are needed to complete the work, the reasons why and when the repair work is estimated to be completed. This must be reported to EPA along with the information listed above.

8.4.1.3 If the estimated completion date is to be exceeded, the reason and new completion date must be recorded and submitted to EPA within 30 days of discovery of the need for an extension along with the information listed above.

8.4.1.4 For industrial process refrigeration, the dates and types of all initial and follow-up verification tests and all test results must be recorded within 30 days after conducting each test.

8.4.2 If additional time is required beyond the initial 12-month period to complete the retrofit/replacement plan for industrial process refrigeration, federally owned chillers, or federally

owned commercial or comfort cooling appliances, the following information is required to be kept on-site and submitted to EPA:

8.4.2.1 The identification of the industrial process appliance

8.4.2.2 The leak rate

8.4.2.3 The method used to determine the leak rate and full charge amount

8.4.2.4 The date a leak rate of 35 percent was discovered

8.4.2.5 The location of the leak(s) to the extent determined to date

8.4.2.6 Any repair work that has been completed thus far and the completion dates

8.4.2.7 A plan to complete the retrofit or replacement of the system

8.4.2.8 The reason more than one year is required to retrofit or replace the system

8.4.2.9 The date of notification to EPA

8.4.2.10 An estimate of when the retrofit or replacement work will be completed

8.4.2.11 If the estimated date changes to move the date forward, documentation of the reasons for these changes must be maintained and submitted to EPA within 30 days of occurring.

8.4.2.12 If the estimated date of completion changes resulting in moving that date forward, notification to EPA regarding the reason and new completion date must be maintained and submitted to EPA.

8.4.3 The leak repair log sheet that must be used to record leak repairs for appliances normally containing 50 pounds of refrigerant with excessive leak rates is available. Refer to the Johnson Controls Environmental Compliance web page for the Excel file containing this log sheet.

8.4.4 If the full charge amount is determined as the mid-point of an estimated range, the following information is to be recorded.

8.4.4.1 Identification of the owner or operator of the source

8.4.4.2 The location of the appliance

8.4.4.3 The original range for the full charge of the appliance, its midpoint, and how the range was determined

8.4.4.4 Any and all revisions of the full charge range and how they were determined

8.4.4.5 The dates such revisions occurred

8.5 Recycling and Recovery Equipment

8.5.1 Johnson Controls Branch Offices are to maintain records of manufacturer, model number, serial number, date of manufacture, and purchase date.

9 RECORDS RETENTION

9.1 All records must be maintained for at least three years

10 EPA NOTIFICATION

10.1 All notifications to EPA should be sent via registered mail return receipt requested.

10.2 TO VIEW U.S. EPA REFRIGERANT RECYCLING REGULATIONS click HERE