Appendix J – Management of Refrigerant and Refrigerant Containing Equipment

F-10.1 Objective

To define the process requirements for refrigerant containing equipment utilized in new construction and renovations.

F-10.2 General

When selecting new refrigeration equipment direct the mechanical engineer to only utilize HFC/PFC refrigerants in systems over 50 pounds per circuit. (Exception HCFC-123 hermetic centrifugal, direct drive chillers are acceptable). Example if 80 tons chilled water is needed specify two 40-ton chillers with under 50 lbs of HCFC-22 in each circuit. This keeps the total charge under 50 pounds per circuit, allows 4 stages of control and utilizes HCFC-22 which is less expensive to maintain over the life cycle.

A multitude of new refrigerants are available, however, the goal is to limit the number of the refrigerants utilized. Standardizing and limiting refrigerant types will save time and reduce maintenance and inventory costs. The Refrigerant Manager and engineering shall work as a team to determine what refrigerants are presently in use and set standards for all future refrigerant equipment purchases. In addition, further maintenance and parts inventory cost savings can be achieved by standardizing on equipment manufactures.

Do not select any open drive compressors as shaft seals are a major leak source over the life cycle of the compressor. Life cycle costs will make the initial cost difference be lower cost and the environmental impact is significant.

The Refrigerant Manager shall work with engineering and contractors to assure all new equipment is properly tagged with FO&M equipment Id numbers and equipment data is provided and entered into RCM.

New equipment shall be leak tested during startup and a report given to the Refrigerant Manager. If leaks are detected, leaks shall be repaired before acceptance of the system by FO&M. A follow-up leak test shall be performed on systems which have had a leak detected during startup procedures.

Engineering shall incorporate the requirements of this section into their normal contract format in the contract specifications manual and on Mechanical Plans as notes or part of the equipment schedules (Sheet M-1).

F-10.3 RCM Software Equipment Input

The FO&M Construction Project equipment input form is at end of this section and shall be completed for all new equipment and demolition equipment. Copies of this documentation are to be included in all operation and maintenance manuals or other job close out documentation prior to final payment. Information must also be submitted to the FO&M Project Engineer and the Refrigerant Manager.

F-10.4 Equipment ID Tags

All new equipment shall be tagged per the FO&M equipment ID standards. The unique FO&M Equipment ID number shall be used on the Mechanical Drawings, Building Automation points lists and in on the **FSU Construction Project equipment input form**.

F-10.5 Leak Testing

All new equipment including packaged equipment - factory charged, field charged, split systems or field-constructed systems with field installed refrigerant piping shall be leak tested during startup. The leak testing process shall utilize the appropriate electronic leak testing equipment and shall be witnessed by the Refrigerant Manager or a designated HVAC technician.

The contractor or installing party shall submit a written and signed statement to the Refrigerant Manager verifying the successful leak testing procedure.

If a leak is detected the following shall occur:

1. Notify the Refrigerant Manager.
2. Document the leak on a RCM Service Order input form or **FSU Construction Project equipment input form**.
3. Repair the leak.
4. Document the action and procedures taken on the RCM Service Order form.
5. Leak test to verify the leak was repaired.
6. Schedule and provide a 30-day follow-up verification leak test with a HVAC team member.
7. Document follow-up leak testing on the RCM Service Order form or **FSU Construction Project equipment input form**.
8. Repeat the above process if follow-up leak is detected.

F-10.6 Demolition – Equipment Removed by Contractors

Refrigerant equipment, which is part of a renovation/demolition contract, shall be subject to the requirements of the FO&M Refrigerant Management Guidelines. The Refrigerant Manager and the engineering department shall work as a team to draft standard contract language to be included in all future contracts, which require demolition/removal of refrigerant equipment. The contract language shall include at a minimum.

1. Requirement for contractor to provide names of EPA certified technicians with their certification number and certification level who will be performing the refrigerant equipment demolition and refrigerant recovery. An RCM Service Order Form or **FSU Construction Project equipment input form** shall be filled out by the certified contractor technician and forwarded to the Refrigerant Manager.

   Note: If the refrigerant is removed by a properly certified contractor technician, the actual demolition may be performed by a non-certified person. In such cases the unit shall be tagged by the contractor technician that the refrigerant was removed on date, by technician name.

In all cases the contractor technician shall tag the unit that the refrigerant was removed.

ENVIRONMENTAL SAFETY NOTICE

ENVIRONMENTALLY HARMFUL REFRIGERANTS AND OIL HAVE BEEN REMOVED FROM THIS UNIT IN COMPLIANCE WITH SECTION 608 OF THE CLEAN AIR ACT

REMOVED BY: (PRINT)_____

COMPANY NAME: (PRINT)_____

ADDRESS: (PRINT)_____

_____

TELEPHONE:_____DATE:__/__/__

SIGNATURE_____

Local AC/R supply

Refrigerant removed from the equipment shall be removed from the site by the contractor in contractor provided refrigerant recovery cylinders. The quantity removed from each unit and from the site shall be documented on the FO&M Construction Project equipment input form or the FO&M Service Order form used for the actual recovery procedure.

Construction New Equipment or Demolition Equipment Input Form

Building Number : _____ **Refrigerant Type:** _____

Building Name: _____ **Total System Refrigerant Charge:** _____ lbs. _____ oz.

Equipment ID: _____ **Circuit A Nameplate Charge:** _____ lbs. _____ oz.

Location: _____ **Circuit B Nameplate Charge:** _____ lbs. _____ oz.

Detail

_____

Equipment Type: _____

Manufacturer: _____

Model: _____

Serial Number: _____

Oil Type: _____

Duty Type: ____ **Over 50 lbs.** ____ **Under 50 lbs.**

Capacity: ____ **Tons**

Volts/Phase/Hz: _____

Other

Date Installed: _____

Company: _____

Date Disposed: _____

Company: _____

General Notes:

Field Service Record for New Equipment Startup or Old Unit Demolition

Date of Service: _____ **Company Name:** _____

EPA Technician Name: _____ **EPA Certification Level:** _____

Leak test unit prior to charging: **Leak Test Performed:** _____ Yes _____ No

☐ Electronic ☐ Deep Vacuum ☐ Other

Amount refrigerant added for startup: **Circuit A Charge:** _____ lbs. _____ oz.

Circuit B Charge: _____ lbs. _____ oz.

Amount refrigerant removed-demolition: **Circuit A Charge:** _____ lbs. _____ oz.

Circuit B Charge: _____ lbs. _____ oz.

Was unit tagged or marked that refrigerant was removed: _____ Yes _____ No

Was refrigerant: _____ Removed from site _____ Left for FO&M reuse

(Note: Refrigerant must be weighed by accurate scales)

Route to FO&M Project Engineer and FO&M Refrigerant Manager
Shawn Pearson

Service Contractor Requirements

F-20.1 Objective

To define the requirements for refrigerant service contractors. It is FO&M's policy to contain all refrigerants and prevent them from entering the environment. The Refrigerant Manager, engineering and purchasing shall work as a team to modify service contracts and notify service contractors of the requirements of this section.

F-20.2 FO&M Refrigerant Mission Statement

FO&M is committed to provide a safe, healthful and environmentally sound workplace for all FO&M or contractor personnel while complying with all environmental regulatory requirements. The goal is to eliminate all refrigerant emissions to the atmosphere.

F-20.3 Responsibilities for Compliance

Contractor shall be responsible and accountable for compliance with the EPA Clean Air Act (CAA) Section 608, 40 CFR Part 82 and state and local codes for all refrigerant-related work. Contractor shall ensure that all contractor employees are made aware of the content of these practices prior to beginning work on refrigerant containing equipment.

Contractor shall provide only proper level EPA certified technicians using EPA certified and registered recovery/recycle units to perform work on FO&M refrigerant equipment.

Contractor shall submit documents with the information to confirm:

- ☑ EPA Certification of all service technicians (Copies of EPA Certification Cards are acceptable).
- ☑ A list of recovery/recycling units to be used and a statement from contractor that recovery units are operating to EPA standards and that units are registered with the EPA.

Contractor shall indemnify and hold harmless FO&M from all regulatory action as a result of their failure to perform service that meet all requirements of federal regulations.

F-20.4 Documentation and Record Keeping

Contractor shall provide documentation on the RCM Service Order input form with all required information to the Refrigerant Manager.

- ☑ Equipment ID tag number
- ☑ Manufacturer and Model number
- ☑ Serial number
- ☑ Location of equipment
- ☑ Refrigerant type
- ☑ Date of service
- ☑ Service, repair or disposal description

- ☑ Details of where a leak was and what was done to repair leak.
- ☑ Quantity of refrigerant added, removed, recovered, recycled, reclaimed or disposed of
- ☑ Quantity of lubricant disposed of, and method of disposal
- ☑ Name(s) of EPA certified service technicians who performed work

If contractor tops off a system to prevent an outage or to keep the unit on line and does not make any leak repairs then the FO&M Refrigerant Manager must be notified within 24 hours of the top off.

F-20.5 Consequences for Non-Compliance

FO&M shall have the right to stop work under any contract at any time if the work fails to meet the EPA regulations.

FO&M shall have the right to withhold payment for services if the proper documentation of refrigerant work or related work is not completed.

