



FESHM 8081: REFRIGERATION MANAGEMENT

Revision History

Author	Description of Change	Revision Date
Rod Walton	Added reference to HFCs as subject to this chapter and federal law.	September, 2014
Rod Walton	Added FESHM Chapter formatting and minor wording changes.	September, 2013
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1.0 INTRODUCTION

The purpose of this FESHM chapter is to establish and promulgate the procedures for managing refrigerants at Fermilab. Refrigerants can pose environmental hazards if released into the environment because of their potential as greenhouse gases (GHG) and/or stratospheric ozone depleting substances (ODS). The potential hazard of a specific refrigerant as GHG is quantified as its Global Warming Potential (GWP), and likewise, the hazard as an ODS is its ozone depleting potential (ODP). Because of this potential, refrigerants are strictly regulated by provisions in §608 of the Clean Air Act, USEPA regulations at 40 CFR 82 and Illinois regulations at 35 IAC 200 *et seq.* A major part of the regulations requires that refrigerant use by certified technicians must be accurately tracked, and that all refrigerant materials are strictly accounted for and documented by owners of equipment having a charge of 50 pounds or more.

In addition, the Superfund Amendments and Re-authorization Act (SARA) requires reports each year to local emergency management agencies and USEPA on the total inventories of refrigerants, and the additional amount of refrigerants in use, or inadvertently released, each year.

The §608 rule requires that a facility like Fermilab have a Refrigerant Manager (RM) to coordinate all activities in which refrigerants are used. This chapter establishes that position within FESS Operations, and outlines the responsibilities of the RM. It also establishes the procedures whereby all refrigerants (including CFCs, HCFCs, and HFCs) used at Fermilab, regardless of the actual point of use and whether the certified technician is a Laboratory employee or a sub-contractor, shall be managed through the RM. This chapter does not apply to cryogenic substances, such as helium, neon, hydrogen, argon, nitrogen and oxygen that are not ODS.

2.0 DEFINITIONS

CFC – Chlorofluorocarbon – any chemical listed as a Class 1 ODS in Sections 608 and 609 of Clean Air Act

GHG – Greenhouse Gas -- a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect.

GWP – Global Warming Potential - the ratio of the warming of the atmosphere caused by a GHG to the warming caused by a similar mass of carbon dioxide.

HCFC – Hydrochlorofluorocarbon – any chemical listed as a Class II ODS in Section 608 or 609 of the Clean Air Act.

HFC – Hydrofluorocarbons – HFCs are a class of replacements for CFCs. Because they do not contain chlorine or bromine, they do not deplete the ozone layer. All HFCs have an ozone depletion potential of 0. Some HFCs have high global warming potentials.



ODP - Ozone Depleting Potential - the ratio of the impact on ozone of a chemical compared to the impact of a similar mass of CFC-11.

Ozone Depleting Substances – any of several classes of organic compounds including chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, and related chlorinated compounds that have been designated by EPA as contributing to the destruction of stratospheric ozone.

Technician/Sub-Contractor - 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.

USEPA – United States Environmental Protection Agency

3.0 RESPONSIBILITIES

Division/Sections shall ensure that:

- All refrigeration equipment for which they are responsible is maintained and serviced in such a way as to prevent and minimize releases of ODS to the environment.
- Equipment is subjected to periodic review to eliminate the use of Class I ODS refrigerants whenever practical.
- Provide FESS Refrigeration Manager with equipment additions including refrigerant type and quantity.
- The FESS Refrigerant Manager is informed in a timely manner as to the types and quantities of specific refrigerants needed for Division/Section operations.
- Refrigerant sub-contractors, who are under contract with Divisions or Sections are aware of this procedure, and that all refrigerants must be checked out from the Fermilab RM or designee at the Site 39 FESS Storeroom.
- Technicians, whether Fermilab employees or sub-contractors, have the appropriate USEPA certification level to evacuate and/or charge a system.
- Documentation of refrigerant use and/or release is provided to the Fermilab RM for reporting purposes.
- Repair any leak found on an appliance with a capacity of 50 pounds or greater are made within 30 days.
- Leak repairs are made within 30 days and equipment is rechecked and results forwarded to the Fermilab RM.

FESS shall:

- Provide documentation for annual reporting related to SARA Title II & III to the ES&H Section in a timely manner, so that reports to the appropriate agencies can be prepared and submitted.



The Refrigerant Manager shall:

- Maintain the inventory of all refrigerants at the FESS Storeroom located at Site 39.
- Maintain the database of equipment at the Laboratory that requires refrigerant, and that has a charge of at least 50 pounds.
- Maintain the Refrigerant Compliance Management database that tracks refrigerant use and releases.
- Ensure that only Certified Technicians are issued refrigerants, and document the certification for all technicians.
- Check out and accept returned refrigerant cylinders to/from certified technicians, either employees of Fermilab, or sub-contractors, and verify the use of refrigerant from the containers by weight.

4.0 PROCEDURES

1. Employees or sub-contractors must complete a “Refrigerant Service Order Form” in order to receive refrigerant from the RM. [**Note: Only EPA certified refrigeration technicians are permitted to perform maintenance on a system containing refrigerant that has the potential for losing gas to the atmosphere.**]
2. Cylinders will be checked out to properly certified technicians upon verification of their certification status. Each cylinder is uniquely identified, and each cylinder weight will be recorded when issued and upon return to the Site 39 Storeroom.
3. Equipment information from the Refrigerant Service Order Form will be transcribed by the RM or designee into the equipment database.
4. Unused cylinders must be returned to the RM at Site 39 and checked in and weighed. All information shall be transcribed by the RM into the RCM database.
5. Sub-contractors must return cylinders each day to be weighed and checked back in to the inventory.