

Environmental Standard Operating Procedure			
Originating Office: <b>MCAS Miramar Environmental Management Department</b>	Revision:  Original	Prepared By:  Environmental Management Department	Approved By:  William Moog
File Name: WCH-ESOP	Effective: 06 Aug 07	Document Owner: EMD	

## Title: Water Chillers

### 1.0 PURPOSE

The purpose of this Environmental Standard Operating Procedure (ESOP) is to provide environmental guidelines for conducting maintenance operations on water chillers.

### 2.0 APPLICATION

This guidance applies to those individuals who perform maintenance activities on water chiller systems onboard Marine Corps Air Station (MCAS) Miramar.

### 3.0 REFERENCES

- 29 CFR 1910 (Code of Federal Regulations)
- 40 CFR 262
- 49 CFR
- Clean Air Act 1990, Section 609
- MCO P5090.2A (USMC Environmental Compliance and Protection Manual)

### 4.0 PROCEDURE

#### 4.1 Discussion:

Water chillers are used to provide central air conditioning (A/C) for the barracks and ground mechanical rooms (in various buildings). MCAS Miramar uses approximately one-hundred (100) water chillers. Routine maintenance of water chillers is necessary in order to maximize performance of the A/C system, however, water chillers contain Freon (typically R-134a or R-22), which is a hazardous material and a hazardous waste. Therefore, proper handling of the water chillers during system evacuation and/or recharge is crucial to minimize impacts to human health and the environment.

Evacuated/recovered Freon is a hazardous material that must be recycled. Evacuated A/C lubricants such as mineral oil and polyester are treated as hazardous waste. Freon and lubricants are evacuated with a Robinair Promax recovery unit.

Units have been equipped with approved containers that must be used for draining and collecting

evacuated/recovered Freon and A/C lubricants.

#### **4.2 Operational Controls:**

The following procedures apply:

1. Ensure Material Safety Data Sheets (MSDS) for Freon, lubricants, and all materials involved in this process are readily available and current.
2. Ensure that training requirements are met and that certifications for all personnel are maintained.
3. Ensure turnover folder information is kept for this ESOP.
4. Ensure that Personal Protective Equipment (PPE) is used including: latex and heavy chemical gloves, aprons, face shields, cranials (head, ear and eye protective head gear), and steel toe boots.
5. Ensure that a fully stocked spill kit is nearby in a designated location.
6. Ensure that fire extinguishers are kept nearby in known locations.
7. Drain all Freon and A/C system lubricants from the water chiller units using a Robinair Promax recovery unit.
8. Drain Freon into approved containers and label container with type of Freon.
9. Drain the A/C system lubricants into approved containers and place a HW label on them. The label will contain the name, address, and phone number of the generator, generator EPA identification number, accumulation start date, shipping name, etc.
10. Contact the Environmental Compliance Coordinator when drum is full of used A/C system lubricants.
11. When draining refrigerant from a unit, perform the following steps:
  - A. Recovery - remove the refrigerant from the unit into an external container.
  - B. Recycle - clean the refrigerant for reuse by oil separation and single or multiple filter dryers.
  - C. Reclaim - restore refrigerant to original chemical specification so it can be reused.
12. Ensure that the Freon recovery tank is not filled beyond 80% of the tanks rated volume at any time.
13. Ensure that the Freon recovery tank is not filled beyond 60% of the tanks rated volume, at 70 degrees F or if transported in a vehicle of any kind.
14. Maintain a hazardous waste log that includes container type accumulation start and end dates, and date container transferred to.
15. Store Freon in a hazardous materials storage locker.
16. Ensure that the storage locker is well ventilated. Freon is an asphyxiate (it displaces oxygen) and poses

serious risks to personnel safety.

17. Ensure that signs reading "Non-Flammable Compressed Gas" are posted around the area and on the storage locker.
18. Place National Fire Protection Association stickers on the outside door of the storage facility to assist others (including the Fire Department).
19. Report all spills immediately to supervisor and EMD regardless of type or quantity.
20. Ensure that a spill report is submitted to the EMD within 24 hours detailing the spill date, time, product spilled, quantity, location, cleanup actions taken, name of the person reporting the spill, etc.
21. If there are any specific situations or other concerns not addressed by this procedure, contact the EMD.

#### **4.3 Documentation and Record Keeping:**

The following records must be maintained for hazardous materials/wastes and equipment:

1. MSDS for refrigerants R-22 and R-134a.
2. Training records and certifications for all unit personnel.
3. Repair and maintenance records for each water chiller.
4. Hazardous materials inventory.
5. Unit inspection records.

#### **4.4 Training:**

All applicable personnel must be trained in this ESOP and the following:

1. Standard Chlorofluorohydrocarbons (CFCs) Universal Certification.
2. Refrigeration course.
3. Hazard Communication Training (initial and annual).
4. Hazardous Materials Supervisor Training.
5. 24-hour Hazardous Waste Operations and Emergency Response (HazWOPER) Occasional Site Worker (initial and annual).

**4.5 Emergency Preparedness and Response Procedures:**

Refer to MCO P5090.2A, Subject: Oil/Hazardous Substance Spills (OHSS) and Spill Prevention Containment & Countermeasures (SPCC) for MCAS Miramar.

**4.6 Inspection and Corrective Action:**

The Environmental Compliance Coordinator (ECC) shall perform or designate personnel to perform inspections. The ECC shall ensure deficiencies noted during the inspections are corrected immediately. Actions taken to correct each deficiency shall be recorded on the inspection sheet.

Water Chiller – Inspection Checklist	
Date:	Time:
Installation:	Work Center:
Inspector’s Name:	Signature:

Inspection Items	Yes	No	Comments
1. Are the MSDS for refrigerants (R-22, R-134a and R404a) current and available for inspection? <i>(29 CFR 1910)</i>			
2. Are training requirements and certifications for all personnel maintained and available for inspection? <i>[MCO P5090.2A 9104.1 (k)(5)]</i>			
3. Is turnover folder information kept for this ESOP? <i>(MCO P4790.2C)</i>			
4. Is PPE used, including gloves (that offer thermal protection), safety glasses, hearing protection (as needed), and steel-toed boots? <i>29 CFR 1910)</i>			
5. Is a fully spill kit kept nearby in a designated location? <i>(29 CFR 1910)</i>			
6. Are fire extinguishers kept nearby in known locations? <i>(29 CFR 1910, MCO P5090.2A)</i>			
7. Is Freon and A/C system lubricants drained from the water chiller units via a Robinair recovery unit? <i>(40 CFR 262, MCO P5090.2A)</i>			
8. Is Freon drained into approved containers and labeled? <i>(40 CFR 262)</i>			

<p>9. Is BSD contacted when a drum is full of system wastes for transfer? (MCO P5090.2A)</p>			
<p>10. When draining refrigerant:</p> <ul style="list-style-type: none"> <li>a. Is refrigerant removed from unit to an external container?</li> <li>b. Is refrigerant cleaned for reuse by oil separation and single or multiple filters?</li> <li>c. Is refrigerant restored to original chemical specifications?</li> </ul> <p>(40 CFR 262, MCO P5090.2A)</p>			
<p>11. Is Freon recovery tank only filled to 80% of the tanks volume? (MCO P5090.2A)</p>			
<p>12. If the Freon recovery tank only filled to 60% of the tanks volume if the temp is 70 degrees or if it will be transported in a vehicle? (MCO P5090.2A)</p>			
<p>13. Is a hazardous waste log maintained that includes container type, accumulation start and end dates, and date container transferred? (40 CFR 262)</p>			
<p>14. Is Freon stored in a hazardous materials locker? (40 CFR 262, MCO P5090.2A)</p>			
<p>15. Is storage locker well ventilated? (40 CFR 262, MCO P5090.2A)</p>			
<p>16. Are signs posted on storage locker and surrounding area reading “Non-Flammable Compressed Gas”? (40 CFR 262, MCO P5090.2A)</p>			
<p>17. Are National Fire Protection Association stickers on the outside door of the storage facility? (MCO P5090.2A)</p>			
<p>18. Are all spills immediately reported to the supervisor and Environmental Department? (40 CFR 262, MCO P5090.2A)</p>			
<p>19. Is a spill report submitted to the Environmental Department within 24 hours detailing spill date, time, product and quantity spilled, cleanup actions, etc. (MCO P5090.2A)</p>			

**ADDITIONAL COMMENTS:**

---

---

---

---

**CORRECTIVE ACTION TAKEN:**

---

---

---

---

**Environmental Compliance Coordinator**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_