

# NIH Policy Manual

## 26101-16 - Management of Ultra-Low Temperature Freezers to Promote Energy Efficiency in Cold Storage for Biomedical Research

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Transmittal Notice

### 1. Explanation of Material Transmitted:

This new chapter establishes the National Institutes of Health (NIH) policy for the selection, inventory, placement, and maintenance of ultra-low temperature (ULT) freezers; and establishes procedures for the inspection of NIH facilities to ensure compliance with this policy.

### 2. Filing Instructions:

**Insert:** NIH Manual Chapter 26101-16, dated 07/01/2016

**PLEASE NOTE:** For information on:

- Content of this chapter, contact the issuing office listed above.
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### A. Purpose

ULT freezers are essential to support NIH mission-critical activities, providing cold storage to preserve materials related to research. When operated and maintained with energy conservation in mind, ULT freezers can play a significant role in reducing NIH energy use. Optimizing energy conservation begins with selecting energy efficient freezers during acquisition. Other factors help too, including performing biannual cleaning and maintenance, and placing freezers in well ventilated and temperature controlled areas without excessive foot traffic. This policy will promote energy conservation by providing direction and guidance to ensure that ULT freezers are managed in an energy efficient manner, thereby reducing the cost of NIH cold storage, and preserving federal dollars for important medical research.

## **B. Background**

Federal laws including the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, and Executive Order 13693 – Planning for Federal Sustainability in the Next Decade, require all Federal agencies to promote energy efficiency and achieve targeted reductions in energy use. This policy ensures NIH is responding with energy conservation measures throughout its facilities. Improving the energy efficiency of ULT freezers at NIH facilities will make a significant contribution.

## **C. Policy**

The NIH will preserve and protect the viability of research materials in cold storage in an energy efficient manner. This policy: (1) requires the selection of energy efficient ULT freezers when acquiring new units; (2) requires all ULT freezers to be listed in the NIH Property System, and when no longer needed, disposed of according to property disposal requirements; (3) requires regular maintenance to be performed on all ULT freezers; and (4) directs the placement of ULT freezers in locations that are adequately ventilated, temperature controlled, and away from excessive foot-traffic. This policy further establishes the procedures for the inspection of NIH facilities to ensure compliance with this policy; to note deficiencies; and to remedy non-compliant occurrences.

### **1. Selection**

All NIH Institutes and Centers (ICs) must purchase energy efficient ULT freezers. The manufacturer's technical specifications for ULT freezers establish the energy efficiency for each model. The NIH Office of Research Facilities Division of Environmental Protection will develop a list of energy efficient ULT freezer models based on commercial availability. This list will include ULT freezers with energy efficiency ratings in the top ten percent of commercially available models. The list will be distributed to all ICs, posted on the NIH Environmental Management System (NEMS) website, and available upon request from the Division of Environmental Protection (DEP), Office of Research Facilities Development and Operations (ORFDO). The list will be updated annually and redistributed to all ICs.

**Note:** This policy encourages ICs to use the New Equipment Sales and Rental Program through the Division of Scientific Equipment and Instrumentation Services (DSEIS), Office of Scientific Resources (SR), Office of Research Services (ORS) to acquire energy efficient ULT freezers. Advantages to utilizing DSEIS for these acquisitions include competitive pricing, and options such as monthly rentals and rent-to-purchase agreements.

### **2. Inventory**

All ULT freezers are considered to be accountable property. IC PCOs must ensure the barcode decal is affixed and the information is entered into NBS within 5 working days

of receipt of equipment. The barcode decal shall be affixed on the front of the accountable property so that it is visible to be scanned for inventory. The NIH Property System will be used as the primary source of data pertaining to ULT freezers.

### **3. Placement**

In order to achieve maximum energy efficiency, ULT freezers require adequate air circulation and placement away from high levels of foot traffic.

- ICs shall place ULT freezers in locations with sufficient cooling and ventilation to support energy efficient operation.
- ICs shall not place ULT freezers in common space.
- ICs shall ensure that there is at least six inches of clear space around the sides and on the top of each ULT freezer.
- Provisions for Grandfathering: Within 6 months of the effective date of this policy, ORFDO will map the location of all ULT freezers, identify those that are recommended for relocation, and collaborate with ICs to develop a plan to relocate these ULT freezers to more suitable locations when it is possible to do so without causing significant hardship. All freezer relocations will be accomplished within one year of the effective date of this policy.

**Note:** Optimal placement will vary by location and setting. For instance, at the Bethesda campus, there is a general preference to place ULT freezers within program areas such as labs and freezer rooms, and not to place ULT freezers in corridors, lobbies, mechanical rooms, alcoves, elevator rooms, and other common spaces. At the Research Triangle Park (RTP) campus, the preference is to place ULT freezers in established designated hallway alcoves.

### **4. Maintenance**

The energy efficiency of ULT freezers is optimized by regular, preventative maintenance. In general, this will include cleaning of external components such as filters, condensers, and condenser coils; and checking to ensure that the gasket seals are intact and that the internal temperature is being held at the set point.

- ICs will perform regular preventative maintenance on all ULT freezers located within NIH facilities, two (2) times each year, at intervals of approximately six (6) months. See Appendix 1 for details.

### **5. Inspection and Compliance**

The ORFDO will inspect NIH facilities and note instances of noncompliance. ULT freezer owners will be alerted to the deficiencies and provided time to correct them. ULT freezers with reported deficiencies which are not corrected will be subject to removal. See Section G.5. in this policy for details.

### **6. Disposal**

ICs will dispose of ULT freezers in accordance with NIH property disposal requirements.

## D. References

This policy was developed in accordance with the following Acts and Executive Orders:

1. Energy Policy Act of 2005:  
<http://www.gpo.gov/fdsys/pkg/BILLS-109hr6enr/pdf/BILLS-109hr6enr.pdf>
2. Energy Independence and Security Act of 2007:  
<http://www.gpo.gov/fdsys/pkg/PLAW-110publ140/html/PLAW-110publ140.htm>
3. Executive Order 13693 - Planning for Federal Sustainability in the Next Decade:  
<https://www.whitehouse.gov/the-press-office/2015/03/19/executive-order-planning-federal-sustainability-next-decade>
4. [NIH Manual Chapter 26101-25-2](#) – Personal Property Management Guide
5. NIH Environmental Management System (NEMS):  
<http://www.nems.nih.gov/Pages/default.aspx>

## E. Definitions

1. **Accountable Property:** Government owned personal property with an acquisition value of \$5,000 or more, or flagged as a sensitive item, that is recorded and tracked in the NIH Property System. All ULT freezers are classified as sensitive, and are required to be included in the NIH Property System.
2. **NIH Facility:** A facility owned, operated, or leased by the NIH.
3. **Ultra-Low Temperature (ULT) Freezer:** A refrigerated cabinet that maintains temperatures between -70°C and -80°C, and is used for the preservation of volatile reagents, biological specimens and other research materials.

## F. Responsibilities

1. The Office of Research Facilities Development and Operations (ORFDO), Office of Management (OM), Office of the Director (OD), NIH has overall responsibility for design, construction, operation, maintenance, renovation and decommissioning of NIH facilities.
2. The Division of Environmental Protection (DEP), ORFDO will:
  - a. Conduct inspections of NIH facilities for compliance with this policy;
  - b. Develop and distribute reports which summarize the data collected during inspections, and note non-compliance locations;
  - c. Recommend mitigation to bring NIH facilities into compliance including the assessment of non-compliance fees and the removal of non-compliant freezers;
  - d. Annually analyze commercially available ULT freezers and establish minimum energy efficiency standards to be used in the acquisition of new units; and

- e. Map the location of all ULT freezers, identify those that are recommended for relocation, and collaborate with ICs to develop a plan to relocate these ULT freezers to more suitable locations when it is possible to do so without causing significant hardship. All freezer relocations will be accomplished within one year of the effective date of this policy.
3. The Division of Technical Resources, ORFDO will review the NIH Design Requirements Manual and make revisions as needed to support the provisions of this policy.
  4. The Division of Scientific Equipment and Instrumentation Services (DSEIS), Office of Research Services, OM, OD, NIH will:
    1. Enter into agreements with ICs, as requested, to provide preventative maintenance for ULT freezers in NIH facilities; and
    2. Use the NIH list of energy efficient ULT freezers when acquiring new ULT freezers.
  5. Scientific Directors of Institutes and Centers (ICs) will:
    1. Follow the provisions of this policy in the selection, inventory, placement, maintenance, and disposal of ULT freezers;
    2. Keep accurate electronic records of the acquisition, inventory, maintenance, placement, and disposal of ULT freezers; and provide these records to DEP personnel upon request; and
    3. Collaborate with DEP to identify ULT freezers located in common spaces and to develop and implement a plan to relocate these freezers to more suitable locations within one year of the effective date of this policy.

## G. Procedures

1. **Selection:** The DEP, ORFDO will develop and annually update a list of energy efficient ULT-freezers. This list will be available on the NEMS website, or by request to the DEP Director. This list will be used in the acquisition of all new ULT freezers.

Note: The DSEIS, ORS is available to provide services in acquiring ULT freezers through 1) New Equipment Sales and 2) Rent to buy programs.

2. **Inventory:** All ULT freezers are considered to be accountable property, and shall be entered into NBS within 5 working days of receipt of equipment. The barcode decal shall be affixed on the front of the accountable property so that it is visible to be scanned for inventory.
3. **Placement:** ULT freezers will be placed only within program spaces with adequate ventilation. No ULT freezers will be placed in common space. At least six (6) inches of clear space will be provided on all sides and on top of all ULT freezers to allow adequate air circulation.

4. **Maintenance:** ICs shall perform regular preventative maintenance on all ULT freezers located within NIH facilities, two (2) times per year, at intervals of approximately six (6) months. See the maintenance checklist in Appendix 1.

Note: The DSEIS, ORS is available to provide this service upon agreement with Principal Investigators, Lab Managers, and/or ICs.

5. **Inspections and Compliance:** NIH facilities will be inspected by ORFDO personnel for compliance with this policy. ULT freezers placed in unauthorized spaces and ULT freezers that are visibly dirty, poorly maintained, or in disrepair will be reported to IC leadership via a three (3)-stage escalation procedure:
  - a. ORFDO representative will post a notice on the freezer, requesting that the owner rectify the noted deficiencies within seven (7) days.
  - b. If the deficiencies are not rectified within seven (7) days, the ORFDO representative will contact the Principal Investigator and the IC Scientific Director, and request that the deficiencies be rectified within seven (7) days.
  - c. If this is unsuccessful, the ORFDO Director will contact the IC Scientific Director for ultimate resolution.

## H. Records Retention and Disposal

All records pertaining to this chapter must be retained and disposed of under the authority of [NIH Manual 1743](#), "Keeping and Destroying Records", Appendix 1, "NIH Records Control Schedules" (as amended). These records must be maintained in accordance with current NIH Records Management and Federal guidelines. Contact your [IC Records Liaison](#) or the NIH Records Officer for additional information.

## I. Internal Controls

1. **Office Responsible for Reviewing Internal Controls Relative to this Chapter:** The Division of Environmental Protection (DEP), ORFDO is responsible for the method used to ensure that controls are implemented and working.
2. **Frequency of Review:** The policy will be reviewed after one year, and then every five years.
3. **Method of Review:** The DEP will maintain oversight and ensure effective implementation and compliance with this policy through various means. The DEP will audit property inventory records and freezer maintenance records and perform inspections of NIH facilities where ULT freezers are located.
4. **Review Reports:** These reports shall be prepared by the DEP and sent to the Director ORFDO, the Deputy Director for Management, and the Deputy Director for Intramural Research. Reports shall indicate that controls are in place and working well, or include any management control issues that should be brought to the attention of the report recipients.

## **Appendix 1: ULT Freezer Maintenance Checklist**

### **1. Check external components of the unit:**

- a. Check temperature settings and actual temperature reading on display. Note discrepancies.
- b. Clean condenser area and condenser coil, either by brushing, vacuuming, or chemically cleaning as needed.
- c. Clean or replace filter.
- d. Check power cord and receptacles. Note deficiencies.
- e. Inspect electrical wiring, components and connections for signs of wear or overheating. Note deficiencies.
- f. Check operation of components. Note deficiencies.
- g. Investigate whether seal functions properly. Note deficiencies.

### **2. If authorization to open laboratory refrigeration unit is provided during scheduled maintenance, then perform the following:**

- a. Inspect hardware and gaskets. Note deficiencies.
- b. Remove ice from gaskets and clean floor after removing ice.
- c. Note the need for users to defrost freezers if ice buildup is evident.
- d. Inspect evaporator coils for damage, obstructions, and cleanliness. Note deficiencies.
- e. Inspect fan grills and evaporator pan for cleanliness. Note deficiencies.
- f. Inspect lighting. Note deficiencies.

### **3. If refrigeration cabinet is empty, then perform the following:**

- a. Pull and clean evaporator fan shroud and clean fan grills and evaporator pan.
- b. Clean evaporator coil.
- c. Investigate why freezer is empty and tag for follow up.