

**Guidelines on the Care and Maintenance of Historic Classical Fresnel Lenses
Transferred with their associated lighthouses under NHLPA
September 23, 2010**

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Introduction

Classical Fresnel lenses that are slated for transfer along with their lighthouses and Classical Fresnel lenses that are still in the lantern rooms and are considered an important historic feature of their lighthouses, represent a unique aspect of both lighthouse and Coast Guard History. These unique lenses are highly sought by a variety of museums and organizations throughout the United States. Due to their historical significance, fragility, and high value, Fresnel lenses require their own set of conditions that are to be met by prospective organizations and candidates who wish to acquire a lighthouse that comes with a Classical Fresnel lens. The United States Coast Guard and the National Park Service have developed a set of guidelines for the care, security and display of a Fresnel lens in order to preserve and protect these valuable national assets.

Facility

Due to harsh environmental conditions and temperature fluctuations inherent in coastal and Great Lakes lighthouses and their lantern rooms, and because of the difficulty of maintaining museum standard conditions in such structures, it is preferable that the Fresnel lenses not be retained or placed in lantern rooms or be relit for navigational purposes. In the event that a Fresnel is to remain in the lantern room (lit or unlit), a plan must be implemented for the protection of the lens in the potentially harsh lantern room environment. The more time, money and effort that is initially invested in the proper housing and care of a lens, the longer one can extend and preserve the life of the lens -in addition to maintaining a visually appealing artifact for future generations.

Care for lenses kept in original lantern rooms

Minimum standards:

- To protect against harmful Ultra Violet rays of the sun, use historically correct shades, curtains or lens covers and/or where possible, UV rated film on windows of lantern room. Minimum UV protective rating required is 99%. (UV rate film must meet the Secretary of the Interior's Standards for the treatment of historic properties.)
- The lantern room to be kept clean and clear of debris and in good repair. At a minimum, there should be no roof leaks, lantern windows are kept properly glazed and caulked to protect against air and water intrusion. Floor, wall, and roof vents should be kept clean and free of accumulations of dirt, insects, birds or their nests. Cleaning tools, stools, ladders, etc. will not be stored in the lantern room.
- Access to lantern room by visitors shall be at all times supervised by authorized personnel (trained docents or staff). Visitors shall be prohibited from touching or coming into contact with any part of the lens with hands or camera equipment.
- Size of lantern room shall dictate number of visitors allowed in- but will not exceed a maximum of 6 at any given time.
- An initial condition assessment of lens with written report to be filed with the Coast Guard Curator's office will be conducted by a professional lampist (see list). Without a baseline assessment, there is no starting point from which to measure the condition. Additional condition assessments of the lens shall be conducted every 5 years by a professional lampist, as determined by a professional lampist, depending on the lens' overall condition.
- Appropriate repair and restoration work shall be completed as necessary and in a timely fashion by a professional lampist.

Optimal standards (same standards outlined above with the following additions/changes):

- Controlled temperature range: 50 to 80 degrees F. Use of heat source may be necessary to maintain this range in colder months.
- Controlled relative humidity range: 40 to 60%. Use of a dehumidifier may be necessary to maintain this humidity range in warmer months.
- Visitors shall be prohibited from accessing and touring the lantern room.
- Access to lantern room by authorized personnel only (trained staff).
- Use of low wattage light sources is acceptable.

Care for lenses displayed inside Keepers quarters/museum

Interior environmental standards, conditions, and lighting:

- For long term care and preservation, the ideal exhibit location is an environmentally controlled setting- such as a museum or restored keeper's quarters with controlled access by staff.
- If the lens is located in a museum or restored keeper's quarters, it must be displayed within a secure enclosure such as a locked Plexiglas case, or defined exhibition area or structure that prevents unauthorized handling or touching. If not protected by a case or other structure, a barrier railing or wall will be located no closer than 5 feet from the lens. The barrier will fully encircle the lens or in the case of a corner display, the exposed faces will be protected by a barrier at a minimum of 4 feet high.
- A larger sized 1st, 2nd, and 3rd order lens should be placed for viewing in a location and with an appropriate barrier that protects it from intentional or unintentional contact such as touching, bumping, knocking, or scraping of the lens by visitors.
- Theft prevention and security safeguards for the lens are required.
- Whenever possible, lens exhibition and display areas should be accessible to all visitors.

- Temperature range: 60-75 degrees F.
- Relative humidity: 45-55%
- Avoid direct sunlight or intense indoor lighting for lens display. Light damage to the glass prisms is cumulative and irreversible.
- Use UV filters or shades on windows if a lens is situated near a window or windows.
- Prolonged exposure to light will speed up degradation of Litharge (lead based putty used to seal the prisms within the metal framework). Once Litharge dries out and cracks, the underlying wood wedges holding the prisms in place within the frame can fall out, or will deteriorate and potentially rot causing the glass to loosen and fall out.
- Use low wattage bulbs and low heat emitting LED lights for exhibit illumination. Light source will be placed slightly above or below the focal point of the lens in order to better disperse the light for display purposes.

Daily and long term care, maintenance, and cleaning methods

- Daily or weekly checks on prism glass and metal framework. Polishing of metalwork is prohibited due to erosion of metal.
- Depending on location, glass and metal parts can be given a light dusting -if needed.
- If the lens appears to be in good condition and maintained within recommended parameters, minimal contact is considered best practice for long term preservation and damage control.
- Staff should be trained initially by a qualified individual familiar with the proper care and maintenance of Classical Fresnel lenses.
- Regular light dusting with a microfiber cloth or soft microfiber duster
- **To wet clean dirty glass:** use a combination of distilled water with small amount of isopropyl alcohol. Add one drop of Woolite. **To wipe:** use either blue paper shop towels or a clean microfiber rag.
- Use of nitrile gloves recommended when cleaning the lens.
- Remove all jewelry, watches and belt buckles prior to cleaning.
- **STRICTLY PROHIBITED** products: sandpaper, Brillo pad, Brasso, Windex or other commercially available cleaning and polishing products.

Financial Considerations

- Money should be budgeted in a dedicated account for a lens condition assessment to be accomplished once every 5 to 6 years, or on an as needed basis, depending on the lens' overall condition. Condition assessments will vary depending on location, but are estimated to cost anywhere from \$1000 to \$3000 (2010 dollars). Repair and restoration costs can vary widely (several thousand dollars to more than \$100,000) depending on size, condition and treatment needs.

Coast Guard Curatorial Services is soliciting public comments throughout the lighthouse community on these proposed guidelines. All comments and suggestions are welcome and should be completed and submitted by Wednesday, December 15, 2010 to the Coast Guard Curator via regular mail or email:

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