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CELLULOSE NITRATE STILL PICTURE AND MOTION PICTURE FILM

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Background

The storage of all cellulose nitrate still picture and motion picture film is regulated by National Fire Protection Association (NFPA) 40 — Standard for the Storage and Handling of Cellulose Nitrate Film. Familiarity with this standard is an essential component of collections management of cellulose nitrate film. In addition, transportation of cellulose nitrate film is regulated by the Department of Transportation (DOT *Code of Federal Regulations* [CFR] 49).

Under normal museum storage conditions, cellulose nitrate film (nitrate) decomposes and may deteriorate to the point of being unstable. As it deteriorates, it emits acidic gasses that can damage nearby materials. Research has shown that severely deteriorated nitrate film stored at more than 100° F for more than one week may spontaneously combust (National Archives and Records Administration, 1949); furthermore, in the event of a fire, improperly stored nitrate film could dramatically increase damage to surrounding collections.

The Smithsonian Institution continues to identify and segregate cellulose nitrate film since the initial issuance of this directive in 1982. Storage of nitrate film is a problem for all museums, archives, and libraries,

Background
(continued)

because new collections are received and new holdings of nitrate film may be found. Therefore, a vigilant Smithsonian policy for the identification and disposition of nitrate film is necessary.

Policy

Smithsonian policy requires prompt segregation of all still and motion picture nitrate film from the collections, and removal of the nitrate film to storage that conforms with the provisions of NFPA 40 (as maintained by the Office of Safety, Health, and Environmental Management [OSHEM]).

Responsibilities

Heads of museums, research centers, and offices are responsible for the implementation of this policy. This responsibility includes training staff to identify nitrate film, and to establish and implement procedures for the removal, copying, storage, or destruction of nitrate film. For additional resources, see the OSHEM *Smithsonian Institution (SI) Safety Manual*, Chapter 24, Collection-based Hazards.¹

Enforcement

As a health and safety matter, all storage of nitrate film is to be reported to OSHEM per the *Smithsonian Institution Safety Manual*, Chapter 24, and monitored by OSHEM and the unit safety coordinator.²

**Recommended
Implementation
Steps**

Accepted practice in museums, libraries, and archives is to copy nitrate film onto stable film bases (silver-halide polyester film) or to digitize the images to preserve and make accessible historically significant images. Proper collections space, consisting of cool or cold room environments, is critical for long-term preservation of originals before and after duplication. For highly valuable nitrate film, retention of the original after duplication is preferred, especially if digital surrogates have been made. Other guidelines are as follows:

^{1, 2} See http://ofeo.si.edu/safety_health/docs/safety_manual_07/ch_24_collections_based_hazards.doc.
This link was verified as of January 12, 2009.

**Recommended
Implementation
Steps** (continued)

- **Reformatting.** Contract vendors may provide duplication services.
- **Transportation within units, to storage, or to reformatting vendors.** All transportation of nitrate film is regulated by DOT CFR 49. Nitrate film is considered a class 4.1 flammable solid. When nitrate film is transported using a commercial vendor, packing must comply with DOT Shipping Regulations in 49 CFR 172. When nitrate film is transported by Smithsonian employees in Smithsonian vehicles, the driver must carry the Material Safety Data Sheet (MSDS) for cellulose nitrate film, and an inventory of the collections being transported. In addition, the container(s) must be labeled to indicate the presence of cellulose nitrate.
- **Storage.** All storage shall comply with the *SI Safety Manual*, Chapter 36 — Fire Protection³, and NFPA 40.
- **Disposal.** When nitrate materials are identified for de-accession, the original nitrate film becomes a “hazardous waste,” which is strictly regulated by the Environmental Protection Agency under the Resource Conservation and Recovery Act, and it is managed according to hazardous waste disposal procedures established by the Institution (*SI Safety Manual*, Chapter 29 — Hazardous Waste Management)⁴, and by federal, state, and local regulations regarding the disposal of hazardous waste.

**Support Services
for Storage
and Handling
of Cellulose Nitrate
Film**

The Smithsonian Institution Archives (SIA) is the liaison for an off-site nitrate film storage facility that conforms to NFPA 40. Museums, research centers, and offices that want to store nitrate film in this facility should arrange transportation, storage, and inventory

³ See http://ofeo.si.edu/safety_health/docs/safety_manual_07/ch_36_fire_protection.doc. This link was verified as of January 12, 2009.

⁴ See http://ofeo.si.edu/safety_health/docs/safety_manual_07/ch_29_hazardous_waste_management.doc. This link was verified as of January 12, 2009.

**Support Services
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Film** (continued)

control of the film with the SIA's Technical Services Division. Space in this remote secure storage facility is limited.

The SIA has developed a protocol that uses Fourier Transform Infrared (FTIR) spectroscopy for the nondestructive identification of cellulose nitrate film. The Archives can be consulted regarding identification, reformatting, storage, and disposal of cellulose nitrate film.

CANCELLATION:
INQUIRIES:
RETENTION:

SD 502, April 5, 2005
Smithsonian Institution Archives (SIA)
Indefinite. Subject to review for currency 24 months from date of issue