MAINTENANCE TECHNICAL SUPPORT CENTER / MAINTENANCE POLICIES & PROGRAMS ENGINEERING / UNITED STATES POSTAL SERVICE

maintenance management order

UNITED STATES POSTAL SERVICE™

SUBJECT: Potential Safety Hazards Associated with High-Intensity Discharge Lamps

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TO:
1. All Maintenance Capable Offices
2. Plant Manager, Maintenance Capable Offices
3. Manager, Maintenance Support, Area Offices
4. Manager, Safety & Health, District Offices
5. Safety Specialist, Plant
6. Human Resource Analyst/Safety, Area Offices
7. Manager, Safety & Health, Headquarters

SAFETY BULLETIN

This Maintenance Management Order (MMO) provides information on two potential safety hazards associated with mercury vapor and metal halide High-Intensity Discharge (HID) Lamps. The potential hazards involve non-passive lamp failures and UV radiation emission exposures.

These HID lamps produce light by means of an electrical arc discharge within an arc tube. The arc tube is contained inside a soft or hard glass outer bulb to protect the arc tube and internal electrical connections from the environment. In addition to protecting the arc tube, the outer bulb absorbs the majority of UV energy radiated by the arc tube while allowing light to pass through.

Metal halide and mercury vapor HID lamps can experience non-passive failures, also referred to as arc tube ruptures. When a non-passive failure occurs, fragments of hot glass and extremely hot quartz (900 degrees C) can be discharged from the lamp. Where open bottom HID light fixtures are used, any combustible material below is susceptible to fire. In addition, personnel can be injured by the hot glass fragments. HID units that are enclosed use a cover made from materials capable of containing the fragments of hot glass.

Lamp manufacturers recommend the following practices for metal halide and mercury vapor HID lamps to reduce the possibility of arc tube ruptures.

1. Turn lamps off at least once per week for at least 15 minutes in systems which operate on a continuous basis (24 hours / 7 days a week).
2. Replace lamps at or before the end of their rated life. Allowing lamps to operate until they fail is not advised and may increase the possibility of arc tube rupture. Consult manufacturer's literature for the rated life of the lamps used in your facility.
3. Operate lamps with the proper circuits and auxiliary equipment.
4. Operate metal halide lamps only in its recommended positions.

In those facilities that have this type of lighting, it is our recommendation that maintenance routes be developed to insure the above items are covered.

Metal halide and mercury vapor HID lamps emit a significant amount of UV energy, which can present another potential safety hazard. If the outer bulb of these HID lamps are broken or punctured there is still the possibility, depending on the type of lamp, that the arc tube may continue to burn for several hours. If the outer bulb is broken, and the arc tube continues to

burn, exposure from UV emissions can occur. UV exposure beyond 15 minutes may produce reddening of the skin and may cause inflammation to the eyes.

Self-extinguishing lamps are available that automatically extinguish after 15 minutes if the outer bulb is broken or punctured. These lamps are marked with the letter “T” on a part of the lamp in such a manner that it is visible after the outer bulb is broken or removed.

Non-self-extinguishing lamps are marked with the letter “R” on a part of the lamp in such a manner that it is visible after the outer bulb is broken or removed. Non-self-extinguishing lamps can cause serious skin burns and eye inflammation from UV emissions if the outer bulb of the lamp is broken or punctured and the lamp is not turned off. These lamps should not be used where people will remain for more than a few minutes after an outer bulb is broken unless adequate covers, enclosures, or other safety precautions are used that will limit UV exposure. If the outer bulb is damaged, replace the lamp as soon as possible.

In all HID lamp applications, the manufacturer’s recommendations for use and operation should be followed to establish a safe lighting system.

To protect against damage to either the arc tube or the outer bulb, HID lamps should be handled carefully. Rough handling can cause scratches or cracks in the outer bulb, resulting in short lamp life and possible injury. Cracks or breaks can be caused by rough handling, by contact with metal surfaces of the light fixture or bulb changer, or by water droplets falling on a hot lamp.

It is important to remove electrical power when replacing lamps that have cracked or broken outer bulbs. Unless the power is turned off, the exposed metal parts of the internal lamp structure such as the arc tube are still connected to power and touching them can cause an electrical shock. In addition, gloves should be used when handling broken bulbs.

Direct any questions or comments concerning this bulletin to the HelpDesk, Maintenance Technical Support Center, P.O. Box 1600, Norman OK 73070-1600; telephone FTS 2000 (405) 573-2123 or toll free (800) 366-4123.

Rex M. Gallaher
Manager
Maintenance Technical Support Center
Maintenance Policies and Programs

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