

# Safety Alert

## *Pier high mast lighting structural failure*

### **DESCRIPTION/BACKGROUND:**

High mast lighting systems are used for lighting on piers and other structures. Design includes a ring assembly at the "mast" or pole top to support fixtures facilitating lowering of the ring by an internal cable pulley/motor system to access/replace lights or bulbs.

**CONCERN:** Mast lighting systems at Naval Station Norfolk have experienced an apparent defect where the latching mechanism fractures at the top of the mast light assembly prematurely. These fractured latching arms can then fray associated support cables which support the light ring. Once the support cables fray to a critical point, the entire light ring assembly can fall catastrophically - which has occurred. A subsequent investigation at Naval Station Norfolk pier high mast lighting has revealed additional lights of various designs similarly affected by latching mechanism fracture and cable fray. Many of the latching mechanisms inspected were reported to have a clearly improved design however, and did not exhibit signs of wear or failure.



**INDIRECT CAUSE:** The cable was incorrectly tightened causing retraction of the cable.

**LESSONS LEARNED/RECOMMENDATION:** Inspect high mast light systems for latching mechanism fracture/cracking. Visually inspect support cables for signs of wear and fray. While not involved in the failure, it is also recommended that the inspection include (1) a visual examination of the internal master cable for signs of wear as it retracts/coils and (2) a visual examination of the high mast pole splice for any signs of cracking, particularly for systems that have been in operation for a number of years. Any latching mechanism or cable failures noted during inspection should result in the light ring being lowered to ground until repairs can be made (or if pole splice cracking is observed the pole taken down). In some case it may be acceptable to provide temporary safety strapping between the light ring and mast pole with engineering consultation to facilitate continued light use until permanent repairs can be made.



**RETROFIT:** Where failures are discovered, repairs/retrofit of internal motor/cable assembly and top latching assembly can be performed. Contractor repairs are underway at Naval Station Norfolk. A manufacturer source experienced with retrofitting high mast lights is ([www.eaglehighmast.com](http://www.eaglehighmast.com)).



Questions contact:  
Curtis Craven PE  
Manager                      Structural  
Engineering  
(757) 445 1528  
[curtis.l.craven@navy.mil](mailto:curtis.l.craven@navy.mil)

Frank Cole PE  
Waterfront Engineering &  
Design  
(757) 322-4203  
[frank.cole@navy.mil](mailto:frank.cole@navy.mil)