

# Navigation Lighting System

The contractor shall provide and install a navigation lighting system complete with 24 VDC LED lights and controls. Lights and controls shall be Lopolight “Pro-Series” or equal and meet the following requirements:

## 1. Nav Lights:

- a. The nav lights shall be USCG approved and comply with Inland Rules 72 COLREGS as amended for power-driven vessels less than 50m in length.
- b. The nav lights shall signal Underway (Masthead, Port, Starboard, and Stern), Towing (less than 200m), Restricted in Ability to Maneuver (RAM), Diving, and Anchored. Lights for Underway shall include a secondary (dual) lamp in case the primary lamp should fail or approach the end of its useful life.
- c. The nav lights shall include integral heating elements (defrosters) to avoid the accumulation of snow and ice on the lamp(s). The defrosters shall keep the lamps frost free down to ambient conditions of -76°F whether the lights are illuminated (on) or in standby (off). Each lamp and associated defroster shall be energized from the same electrical conductors - i.e. no additional wiring shall be used to energize the defrosters. Each lamp shall include an internal thermostat to ensure the defrosters turn on/off when needed.
- d. The nav lights shall meet the requirements of MIL STD 461(G) to avoid the emittance or reception of EMI and/or RFI.
- e. The nav lights shall meet the requirements of MIL-STD-901E for withstanding impact and shock.
- f. The nav lights shall meet the requirements of MIL-STD-167 1A for withstanding mechanical vibration.
- g. The nav lights shall include the means to provide galvanic separation.
- h. The nav lights shall not be obscured by the mast or adjacent equipment as prescribed in Annex I of the COLREGS. Installing lights on both sides of the mast is an acceptable means to mitigate obstructions if they can't be avoided with stand-off brackets.
- i. The nav lights shall have a useful life of 50,000 hrs and shall be electronically compensated to ensure their conformity with viewable-range requirements during that time.
- j. The nav lights shall comply with EN 14744 and shut off at the end of their useful life (when they can no longer comply with the viewable-range requirements).
- k. A complete set of nav light spares shall be provided that includes one (1) each of the following: nav light of each type defined herein, mounting kit (base, glands, blanking caps, screws, nuts and pin connectors).

## 2. Nav Light Controller (NLC) for control and monitoring of the Nav Lights:

- a. The NLC shall include a main control panel with separate switches/buttons that control each light. The control panel shall include four (4) Group buttons that are programmed for Underway, Towing, RAM/Diving, Anchored. The control panel shall include a dimmer to minimize light pollution in the Pilothouse. The dimmer shall dim the control panel indication lights to black. The NLC shall also provide a secondary means to control the lights (on/off) if the main control panel becomes inoperable or inaccessible.
- b. The NLC shall meet the requirements of ABS HSC 4-6-2/13 and shall be powered by two sources: one from the primary switchboard (120VAC/1/60) and one from the secondary (emergency) switchboard (24VDC). The NLC shall automatically transfer to the secondary source if the primary source is lost.
- c. The NLC shall provide monitoring of the nav lights. Monitoring shall include constant evaluation of each light for faults and for determining remaining useful life. In the event of a problem, the NLC shall provide a visual and audible alarm on the main control panel. Additionally, in the event of a primary lamp failure, the NLC shall automatically transfer to a secondary lamp when available.
- d. The NLC shall meet the requirements of MIL STD 461(G) to avoid the emittance or reception of EMI and/or RFI.
- e. The NLC shall meet the requirements of MIL-STD-901E for withstanding impact and shock.
- f. The NLC shall meet the requirements of MIL-STD-167 1A for withstanding mechanical vibration.
- g. A complete set of NLC spares shall be provided that includes one (1) each of the following: any replaceable circuitry components (daughter board, relay, and breaker).