

PELANGI

Application Note 31059

Blyth East Pier Lighthouse

Lighthouse History :

The existing Lighthouse was originally installed with a 3rd order GP4 x 2 panel prismatic lens driven by clockwork mechanism and lit by PV burner. The Lighthouse also had a lower 3rd order drum lens also lit by PV burner, and both were maintained by the keeper. When electricity was connected, the station clockwork mechanism was replaced with motors, and the light sources changed to use LC15 lamp changers, each with 1000 watt lamps. Monitoring was provided via a hard-wired system to the Harbour Masters office.



3rd order revolving lens with LC 15 changer.



3rd order lower Drum lens section with LC15.

Project Requirement:

The aim was to modernise, whilst retaining the existing range of 21 miles White and 17 miles on the red sector, and character of FL (4) 20 sec (0.3 sec flash) with the revolving lens and 13 miles on lower. We wanted to extend the lamp life of 1000 hours, fit a new lampchanger into existing controls without modifying connections, and remove the old LC15 lampchanger which used hazardous mercury in glass relays.

Our Technical Solution:

1. 21 miles range required an effective intensity of 200,000cds. In order to achieve this we used a 70 clear watt cdmt lamp mounted inside both lens mounted on PA2 lamp changers.
2. Revolving lens assembly with its large focal height permitted both the lamp changer, ballast and controls to be fitted inside the lens assembly, reducing cable runs and retaining the existing wiring between changer and control cubicle.

The lower lens was fitted with PA2 and pedestal due to space restrictions in support structure. Ballast controls mounted separately.



PA2 lamp lampchanger, support pedestal and control cubicles for direct retro-fitting inside revolving lens utilising same fixing centres.

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Our Technical Solution (cont):

3. The existing traditional lighthouse lamps have a nominal life of only 1000 hours. Thus on fixed duty have an average life of 2 ½ months based on a 14 hour night . Longer in winter. By selecting Cdmt lamps with an average life of 10,000 hours, increased the unattended period between lamp changes to 1.9 years.
4. Traditionally the lamp temperature variation between a whale oil lamp, then PV burner, then Acetylene Dalen mantle, and finally Tungsten lamp, requires a change in the colour filter used when upgrading light sources. Cdmt lamps do have a wide colour spectrum, which is helpful, although in some cases they are not directly interchangeable. In this case since the lower light is Red, no change was required.



PA2 lampchanger installed in lower lens with 70 watt Cdmt lamp lit in position no 1.

5. The PA2 does not employ any Mercury in its changeover mechanism, thus by replacing the complete LC15 it was possible to reduce the health and safety risk due to exposure of Mercury. Certainly at some point in the future the removal of mercury from the pedestal will need to be addressed by draining the Mercury and fitting a Pelangi bearing conversion kit, or remounting the lens on our gearless PRL600 pedestal.



Captain Mike Haley of the Port of Blyth was very pleased with the conversion as it has achieved a number of other of additional benefits aside from the original intention to replace aging and unreliable equipment. These include:

- Reducing the number of planned maintenance visits from 5 per year to only 1 with associated cost savings.
- Retention of a mechanism protected under preservation order as a functional piece of equipment and extending its life without the need to replace it and remove it to a museum.
- Reduction of the electrical power consumption from 2000 watts to 140 watts with associated cost savings.
- By utilising the PA2 and its drive board he was able to retro-fit 2 assemblies which did not involve changing any of his controls or exist telemetry equipment.

