

Lighthouse Optic

Baily Lighthouse, Howth Head, Dublin Port



Baily Lighthouse on Howth Head

PROJECT OVERVIEW

Location:	Ireland
Date:	December 2012
Owners:	Commissioners of Irish Lights
Site:	Baily Lighthouse, Howth Head, Dublin Port
Product:	LED Lighthouse Optic
Application:	Lighthouse Lamp

BENEFITS

- Individual LEDs can be switched off in unwanted directions such as over land to save power
- Low power consumption compared to traditional fixtures
- Superior service life combined with ease of maintenance
- Optional monitoring systems are available such as AIS, GSM or satellite monitoring
- Monitoring of individual LEDs and shut down procedures in the event of failure

Baily Lighthouse is located on Howth Head at the entrance to Dublin Port. It houses a 375mm 4 panel catadioptric annular rotating lens exhibiting a character of Fl 15 sec, and had a published range of 26 miles.

Design Concept

Baily was previously fitted with a 100V 1500W lamp. These lamps were designed with large tungsten filament cage diameters to provide an electric light source which matched the original Acetylene mantel and PV burner diameters hence preserving the optical efficiency of the lens. Until now it's been impossible to modernise the light source to take advantage of the next generation of low power LED emitters. This is because LED arrays of sufficient intensity within a small enough diameter have not been available.

With recent advances in surface mounted LED technology it has now become possible to create a composite light source of the required diameter to work efficiently with the traditional lens optics.

Solution

The UK General Lighthouse Authorities R&RNAV have recently developed a new light source for this purpose, which is now manufactured by Pelangi under license. This is suited for both flashing applications in drum lenses (see application note for Achillbeg) and fixed character applications in a rotating optic such as the application for the Commissioners of Irish Lights at Baily Lighthouse.

The new LED light source now achieves an effective range of 21 miles and offers the best optical gain for solarising traditional prismatic lens stations. With power consumption of just 78 watts @ 24 volt DC the solution outperforms all other LED solutions. One additional advantage of the new light source is that individual LEDs can be switched off in unwanted directions (eg. over land) saving additional power.



For more information on this project or technology please contact Pelangi International

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Simple Conversion

With a minimum of alterations, the new light source is mounted centrally in the focal plane of the lens in place of existing lamps and changers to suit the old fixing details, on a mounting made to achieve the correct focal height.

Light Source details

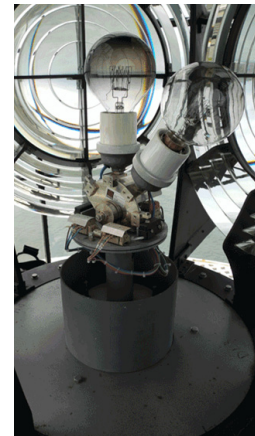
The new light source contains 6 LED's arranged around a specially designed heatsink providing uniform 360 degree coverage. LED's 1, 3 and 5 are driven from one flasher and synchronised to a second flasher driving 2,4 and 6 LED. The individual LED's have considerable optical overlap. Should either flasher fail in service, the remaining flasher driving 3 LED's will still create a 'standby' all-round light at reduced output.

Control and Monitoring

The Baily system was designed to provide Commissioners of Irish Lights with stage monitoring of individual LED and shut down procedures in the event of partial failure. The cubicle was also provided with interfaces for direct connection to their monitoring via AIS.

Alternative built-in GSM or Satellite monitoring can be provided using the well proven Lightguard with Webscada as employed by the Northern Lighthouse Board in Scotland. Satellite monitoring removes restrictions in VHF range.

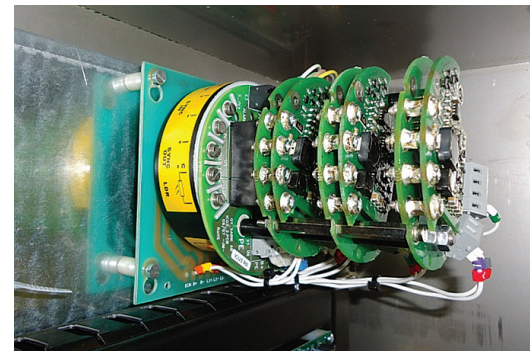
Simplified combined power supplies and drivers cubicles are available for connection to existing controls if only the light source is being changed.



BEFORE: Traditional incandescent light source, 1500 Watts



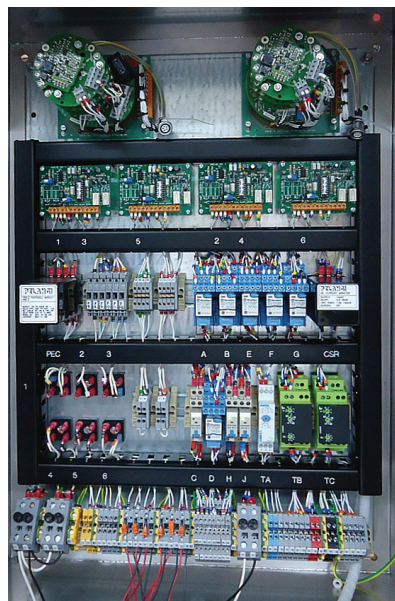
NOW: State-of-the-art LED light source, 78 Watts



3 tier LED driver and Flasher assembly each driven by a single LED Flasher mounted on a quick release PCD for easy maintenance



Front Panel of Control System to Commissioners of Irish lights specification driving the 78W 24V Light Source and combined Triple Photo cell



Twin Stack - triple tier driver and flasher assembly with 6 individual current monitors housed in a custom made 800 x 750 x 200 mm stainless steel cubicle to suit Supply 24 V DC ideal to power from solar as supplied to Commissioners of Irish Lights.

Specific site information can be obtained from:

<http://www.commissionersofirishlights.com/cil/aids-to-navigation/lighthouses/baily.aspx>

Additional historical video information viewed by clicking here:



or by visiting

<http://www.youtube.com/watch?v=ul4SMMYVEOQ&feature=related>