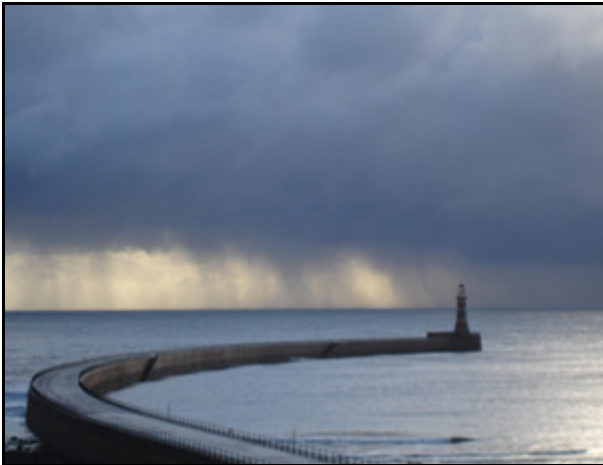


PELANGI

Application Note 31559

Upgrading Roker

History : Roker lighthouse built by Henry Hay Wate, was commissioned on 23rd Sept 1903 on the North Outer Breakwater of the Port of Sunderland. The original cut and polished prismatic lens was removed in 1986 to Sunderland museum where it currently resides in their store awaiting re-exhibition. It was replaced at the time by a gearless pedestal which utilised sealed beam lamps in place of the original lens. Consuming 1600 watts in two beams arranged back to back, rotating at 6 RPM achieved a single flash character every 5 sec and a range of 23 miles. The standby lamp set operated at reduced range when mains or lamps failed.



After 21 years of service the old pedestal was starting to show its age. On Health and Safety grounds the port decided to take the opportunity to replace it with a more energy efficient **PRL400** pedestal manufactured by **Pelangi** which did not use mercury to transfer power to the rotating lamp. It also reduced the power consumption from 1600 watts to only 70 watts – Rotating at 1 ½ rpm now with 8 panels the PRL400 consumes 1/24th of the power to achieve a range of 22 miles with battery back-up on main and duty lamps should mains fail.

Remote radio monitoring fitted by Pelangi engineers in 1995 when the old pilot house was demolished would be reconnected .

Project Aim : To modernise both the fog signal, power supply and main optic in stages to ensure that the lighthouse remained in service throughout.

Technical Solution :

1. **Phase I** Pelangi International Limited refurbished an LIED300 fog signal in advance with an identical model to that in service. When completed a crane was used to remove the old signal from the 25 metre parapet . In the same operation the new refurbish signal was installed and commissioned the same day .

During this first phase a 30 amp mains battery charger was installed replacing the previous unit and the new batteries carried the 98 steps to the light room ready for installation.



2. Meanwhile **Pelangi** engineers design a self supporting pedestal which carried the **PRL400** pedestal and control cubicle which would utilise the mounting holes of the original pedestal. This assembly was carried to the light room in knock down format, assembled and commissioned adjacent to the old optic ready for transfer.
3. **Phase II** On the selected day the old pedestal was disconnected and moved aside to permit the new unit to be installed within the working day and without interruption of service. This would also ensure that the hazardous job of removing the 7 kgs of liquid mercury from the old pedestal without pressure in correct PPE equipment and in a controlled environment could occur.

PELANGI

Application Note 31559

Upgrading Roker

4. **Phase III** Having made the transfer to the new equipment forced venting fans were installed and the light room mercury levels monitored on a continuous basis. The Pelangi engineers equipped in full protective overalls and face masks then began the task of dismantling the pedestal.



On the 17th Oct 2007 the PRL400 was commissioned by Pelangi engineers and handed back to the Port Authority, once more reconnected to the new port control building via VHF telemetry.

5. With the pedestal dismantled and mercury removed the fans were left running over night to ensure no mercury vapour was present either in the structure or approach tunnels. In the morning the lighthouse was declared free of mercury vapour below 25pmm.
6. With the light room safe using traditional rope and pulleys the now safe pedestal weighing 194 kgs was removed to the base of the lighthouse for collection by the port engineers with minimal disruption to the fishermen who were removed from the base during the operation.
7. Finally the old batteries were removed and replaced by the new Ni-cadmium batteries previous waiting in the watch room. The old batteries being removed along with the old pedestal by traditional slinging.



8 Panel - PRL400 pedestal and controls: Roker