Input paper: [[1]](#footnote-1) ENG8-10.10

Input paper for the following Committee(s): check as appropriate Purpose of paper:

**□** ARM **x** ENG **□** PAP **x** Input

**□** ENAV **□** VTS **□** Information

Agenda item [[2]](#footnote-2) (from agenda) 10

Workplan Task Number / Technical Domain 2 …………………………………

Working Group WG2

Author(s) / Submitter(s) Ahmet ÖZTEKİN

Replacement of Light Source in Anadolu Lighthouse

# Summary

Under ENG7 action 33 Committee participants are requested to provide input on any relevant experience with the use of modern AtoN equipment and systems in heritage lighthouses

## Purpose of the document

Purpose of the document is to submit useful and explanatory example with regard to use of modern AtoN equipment and systems in heritage lighthouses

## Related documents

Light Sources used in Visual Aids to Navigation 1043

Use of Modern Light Sources in Traditional Lighthouse Optics 1049

# Anadolu Lighthouse

This major lighthouse was established in 1856 by the french.It is located in an important position in Anatolian side which controls entries from Blacksea to İstanbul Strait. The tower was made of masonry structure and has 20 metres altitude as well as elevation of it from sea level is 75 metres. As a light source, a metal halide lamp which has 400 W power had been used before. In May 2017 , metal halide lamp was replaced by MLL 1000 LED light.



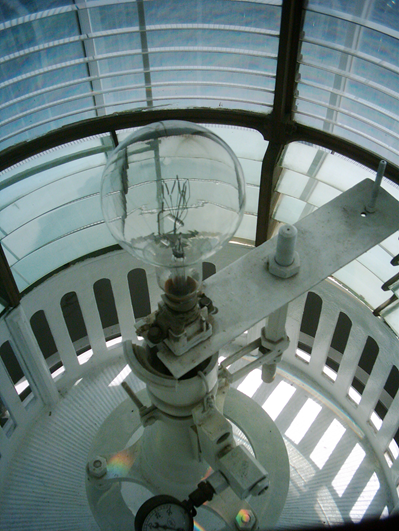
Figure 1: Anadolu Lighthouse

Technical specifications of the metal halide lamp:

* Power consumption(with ballast)=455 W
* Operational life = approximately up to 20,000 hours
* Luminous flux = 36,000 flux
* Efficiency = 36,000 / 455 = 79 lumen/watt

Technical specification of the LED (MLL 1000) light:

* Power consumption = 150 W
* Operational life = approximately up to 100,000 hours
* Luminous flux = 23,000 flux
* Efficiency = 23,000 / 150 = 153 lumen / watt

***Figure 2: Metal halide lamps previously used*** ***Figure 3: MLL 1000 LED light used now***

# CONSıDERATİON OF the REPLACEMENT

Metal halide lamps require a ballast circuit to regulate the lamp current an igniter or ‘striker’ to initiate ionisation during start up. If the supply voltage is interrupted sufficiently for the arc to be extinguished, the lamp will not relight until it cools and arc‐tube vapour pressure decreases to a level that allows the arc to re‐strike. This may take as long as fifteen minutes. The lifetime of metal halide lamps previously used is approximately 20,000 hours. But driver, ballast, ignitor or another component may break down before. This case may increase maintenance cost in comparision with that of LED lights. On the other hand, MLL 1000 LED light has operational life with 100,000 hours and thus requires less maintenance cost. Because operational life of LED light is as five times as that of metal halide lamp. Besides energy efficiency of LED light is more than energy efficiency of metal halide lamp. While metal halide radiates wide band spectrum including infrared and ultraviolet lights which can’t be seen by human eye and bring about UV output, LED radiates only radiate in narrow spectral band. Thus LED light is getting more efficient than metal halide lights.

Advantages and Disadvantages of the Replacement:

√ Less maintenance cost

√ More efficient

√ Long operational life

√ Environment friendly

X Purchase cost

# Action requested of the Committee

The Committee is requested to consider if this document may be used as example for use of modern AtoN equipment and systems in heritage lighthouses

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Input papers should be assigned to a work task as listed in the Committee work plan which is available in input papers. Leave open if uncertain but consider how the paper is to be processed if not relevant to a work task [↑](#footnote-ref-2)