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Technical Domain / Task Number 2 Visual

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Service Conditions Factor

# Summary

The service conditions factor applied to the measured/calculated intensity of a light in order to account for degradation of luminous intensity due to service conditions not typically tested in a lab environment. The attached document discusses the service conditions factor and suggests that it would be beneficial to assess whether the presently recommended factor is still appropriate for modern practices.

## Purpose of the document

* To disseminate results of measured service conditions so that lighthouse authorities can ensure an adequate service conditions factor is used.
* Spark interest, discussion and further work in determining the most appropriate service conditions factor(s)

## Related documents

N/A

# Background

The service conditions factor is used to account for dirt/salt deposits on equipment such as the lens and glazing, equipment degradation over time (primarily lumen output of light source) and meteorological conditions. Several IALA documents discuss the service conditions factor, see [1]-[4]. IALA recommends that a value of 0.75 should be used for the service conditions factor [2][4]. This value has been in use for some decades and as such, it would be beneficial to assess whether it is appropriate for modern practices.

# Discussion

Examples of modern practices that may influence the degradation of luminous intensity include:

* With reliable automated lighthouses the frequency of personnel on station is often reduced, consequently reducing cleaning frequency of the lens and glazing.
* An increasing number of stations utilise LED light sources, which have slower lumen depreciation than other light source technologies used in AtoN.

R&RNAV have conducted measurements of additional losses through lens and glazing due to degradation from a clean condition. Some LED manufactures provide comprehensive data on the lumen depreciation of their LEDs. Some details of these are included in the attached document.

By increasing awareness of individual components of the service condition factor, lighthouse authorities will be better equipped to assess appropriate values for present maintenance regimes or to those regimes are adequate for the value of service conditions factor used.

# References

1. IALA NAVGUIDE: Aids to Navigation Manual, International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), Seventh Edition, 2014.
2. IALA Recommendation E-200-2 On Marine Signal Lights Part 2 – Calculation, Definition and Notation of Luminous Range, International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), Edition 1, December 2008.
3. IALA Recommendation E-200-3 On Marine Signal Lights Part 3 – Measurement, International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), Edition 1, December 2008.
4. IALA Recommendation E-200-5 On Marine Signal Lights Part 5 – Estimation of the Performance of Optical Apparatus, International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), Edition 1, December 2008.

# Action requested of the Committee

* Discuss whether the presently recommended value remains appropriate
* Conduct measurements to obtain information pertaining to the service conditions factor (e.g. additional losses through glazing between maintenance visits).
* Share measurement results and relevant experience pertaining to the service conditions factor

1. Input document number, to be assigned by the Committee Secretary [↑](#footnote-ref-1)
2. Leave open if uncertain [↑](#footnote-ref-2)