

# **IALA Recommendation O-130**

**On**

## **Categorisation and Availability Objectives for Short Range Aids to Navigation**

**Edition 1**

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# Categorisation and Availability Objectives for Short Range Aids to Navigation

(Recommendation O-130)

## THE COUNCIL,

**RECALLING** that one of the aims of the Association is to foster safe, economic and efficient movement of vessels by the improvement and harmonisation of aids to navigation world-wide;

**RECALLING ALSO** that IMO SOLAS Chapter V, Regulation 14, includes the requirement that Contracting Governments undertake to arrange for the establishment and maintenance of such aids to navigation as, in their opinion, the volume of traffic justifies and the degree of risk required;

**RECALLING FURTHER** that IMO Resolution A.953(23) identifies the required signal availability for world-wide radionavigation systems and that other IALA recommendations identify availability requirements for hyperbolic radionavigation and differential GNSS augmentation systems;

**RECOGNISING** that IALA Recommendation E-105 (May 1998) on “The need to follow national and international standards” advises in Recommends (2), that purchasing authorities include reliability and quality requirements in their specifications when procuring Aids to Navigation equipment;

**RECOGNISING ALSO** the importance of describing the management objectives for the operational performance levels of Short Range Aids to Navigation provided to mariners and the need to provide guidance to National Members on suitable and realistic levels of operational performance;

**NOTING** that it is possible to identify the required level of availability during the design phase of Short Range Aids to Navigation by taking into account the known theoretical relationship between individual component reliability and system availability;

**NOTING ALSO** that risk management practices enables the assessment of availability of an aid to navigation or system based upon its criticality to the mariner and for the protection of the marine environment;

**HAVING CONSIDERED** the proposal of the ANM Committee, prepared in consultation with the EEP Committee;

**ADOPTS** the Availability for Short Range Aids to Navigation, given in the Annex to this Recommendation; and

**RECOMMENDS** that National Members and other authorities providing Aids to Navigation categorise their aids to navigation in accordance with the categories set out in the Annex to this Recommendation.

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# ANNEX

## Categorisation and Availability Objectives for Short Range Aids to Navigation

### 1 Introduction

Availability of Aids to Navigation has traditionally been linked to the size and complexity of the individual aid to navigation or system of aids to navigation concerned – for example, major lighthouses have been rated as Category 1 and light buoys as Category 3. While this correlation has been relevant in the past for Aids to Navigation (AtoN) and systems of AtoN, changes occurring in navigational safety requirements and in the technologies used in AtoN have indicated a need to review the basis on which availability is defined.

The adoption of contemporary risk management practices enables AtoN management authorities to define, preferably in consultation with mariners and other stakeholders, the availability requirements for the aid to navigation or system concerned, and to assess its future categorisation based upon its navigational significance. The resulting categorisation of the AtoN or system of AtoN may result in some traditional higher category aids being downgraded and, alternatively, the potential for lower category aids to be upgraded.

#### 1.1 **Scope**

This document provides a method to categorise and calculate aids to navigation availabilities for both individual aids to navigation and systems of aids to navigation. It does not consider other aids to navigation considered in the mix of aids to navigation such as radionavigation systems or Vessel Traffic Services (VTS).

#### 1.2 **Definitions**

*Short Range Aids to Navigation: All aids to navigation intended for use within visual, audio or radar range of the mariner.*

*System of aids to navigation: A group of complementary short range aids to navigation intended to collectively provide sufficient and timely information with which to safely navigate vessels within and through a waterway.*

*Availability: The probability that an aid to navigation or a system of aids to navigation as defined by the Competent Authority is performing its specified function at any randomly chosen time. This is expressed as a percentage of total time that an aid to navigation or a system of aids to navigation should be performing their specified function.<sup>1</sup>*

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<sup>1</sup> Reference – as adapted from the IALA Guidelines on Availability and Reliability of Aids to Navigation, Theory and Examples (Edition 2, December 2004).

### **1.3 Considerations**

The categorisation of aids to navigation should be based on a Risk Assessment methodology that assesses the navigational significance of an individual aid to navigation or system of aids to navigation, taking into consideration factors such as:

- Waterway significance,
- Areas of environmentally sensitivity,
- Nature and type of cargo,
- Nature and type of navigation,
- Traffic density,
- Mix of Aids to Navigation and their coverage,
- Climate (ice, fog etc.),
- National concerns and priorities.

### **1.4 Assessment Aspects**

The categorisation of an individual aid to navigation or system of aids to navigation also depends on aspects such as:

- Existing technology,
- Logistics,
- Redundancy,
- Accessibility,
- Other navigational services available to the mariner including, Pilotage, VTS, GNSS, etc.

Categorisation should be determined or confirmed, wherever practicable, in consultation with mariners and other stakeholders who use the particular short range AtoN or system of AtoN.

Formal procedures for collecting, processing and recording availability data should be established.

## **2 Categories**

There are three categories of aids to navigation, reflecting their navigational significance.

**Category 1:** An Aid to Navigation (AtoN) or a system of AtoN that is considered by the Competent Authority to be of **vital navigational significance**. For example, lighted aids to navigation and racons that are considered essential for marking landfalls, primary routes, channels, waterways, dangers or the protection of the marine environment.

**Category 2:** An AtoN or a system of AtoN that is considered by the Competent Authority to be of **important navigational significance**. For example, it may include any lighted aids to navigation and racons that mark secondary routes and those used to supplement the marking of primary routes.

**Category 3:** An AtoN or a system of AtoN that is considered by the Competent Authority to be of **necessary navigational significance**.

The Categorization of a system of aids to navigation is independent of the rating of the individual aids within the system. Such a system can be composed of various categories of aids to navigation. For example, a system rated as category 2 could include individual AtoN that are rated category 1, 2 or 3. A buoyed channel rated category 2 may have an entrance/fairway buoy rated category 1.

## **3 Availability objectives**

The table below provides overall availability objectives for each category of individual AtoN or system of AtoN as provided by the competent authority.

<b>CATEGORY</b>	<b>AVAILABILITY OBJECTIVE</b>	<b>CALCULATION PERIOD</b>
1	99.8%	Availability Objectives are calculated over a three-year continuous period, unless otherwise specified
2	99.0%	
3	97.0%	

The minimum availability of any individual AtoN should be 95%. Where the availability of an individual AtoN consistently falls below 95%, consideration should be given to the discontinuance or the replacement of that AtoN.

## **4 Calculation of Availability**

Availability should be calculated using the following equation, with the most accurate time available:

$$\text{Availability} = \frac{\text{Total Time} - \text{Down Time}}{\text{Total Time}} \text{ expressed in percentage (\%)}$$

*Total Time* is the time that an individual AtoN or a system of AtoN should be performing their specified function.

*Down Time* is the sum of the periods during which the AtoN of the system of AtoN are unable to perform their specific function. It does not include those periods when the mariner has been notified of a discrepancy by **prior** publications through a Preliminary Notice to Mariners<sup>2</sup>.

The aid to navigation availability should be calculated over a continuous 3 calendar year period.

The IALA Navguide should be consulted for further information on calculating the availability.

A *failure* is the malfunction of an aid to navigation or system of AtoN to display its proper characteristics or to be on its assigned position for its intended use by the mariner. As such, a failure of a technical function is not necessarily considered an aid to navigation discrepancy. For example, if the main power supply has failed but the light continues to function at normal intensity on standby power, this is not considered a failure, since the aid to navigation continues to provide its characteristics to the mariner. The failure may be caused by equipment malfunction, or scheduled or unscheduled maintenance work.

## **5 Related Documentation**

The latest editions of the following IALA documents are relevant to the identification of availability objectives for aids to navigation or systems:

- IALA Aids to Navigation Guide (Navguide),
- IALA Guidelines on Risk Management,
- IALA Guidelines on Availability and Reliability of Aids to Navigation – Theory and Examples (Edition 2, December 2004),
- IALA Guidelines on Levels of Service.

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<sup>2</sup> 2 months notification, as defined by the International Hydrographic Organization (IHO) Technical Resolution F3.5.