



**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

## **FINAL REPORT**

### **THE SECOND MEETING OF THE WATER AERODROMES SMALL WORKING GROUP (WASWG/2)**

COLOMBO, SRI LANKA, 29 FEBRUARY – 2 MARCH 2016

The views expressed in this Report should be taken as those  
of the Meeting and not the Organization

Approved by the Meeting and published by the  
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### **Report on Agenda Items**

Agenda Item 1:	Election of Chairperson Adoption of Agenda
Agenda Item 2	Review of the Terms of Reference of the Small Working Group
Agenda Item 3:	Establish working methodology and future work programme
Agenda Item 4:	Discuss draft water aerodrome standards
Agenda Item 5:	Any other business
Agenda Item 6:	Industry visit to the water aerodrome operation site

### **Attachments to the Report**

- Attachment 1 – List of Participants
- Attachment 2 – List of Papers
- Attachment 3 – Draft Water Aerodrome Standards

## 1.1 Introduction

1.1.1 The Second Meeting of the Water Aerodromes Working Group (WASWG/2) was held in Colombo from 29 February to 2 March 2016 at Hotel Galadari, Colombo.

## 1.2 Attendance

1.2.1 The Meeting was attended by 26 participants from 4 Member States and ICAO.

1.2.2 A List of Participants is given at **Attachment 1** to the Report.

## 1.3 Opening of the Meeting

1.3.1 Mr. Nimalsiri, DGCA and CEO, Civil Aviation Authority of Sri Lanka welcomed the participants and highlighted the importance of developing the Model Requirements for water aerodromes for use as a reference document in APAC Region.

## 1.4 Officers and Secretariat

1.4.1 Mr N.C Sekhar, Regional Officer/AGA, ICAO Asia and Pacific Office, was the Secretary of the Meeting.

## 1.5 Agenda of the Meeting

1.5.1 The Meeting adopted the following Agenda:

- |                |                                                                |
|----------------|----------------------------------------------------------------|
| Agenda Item 1: | Election of Chairperson<br>Adoption of Agenda                  |
| Agenda Item 2  | Review of the Terms of Reference of<br>the Small Working Group |
| Agenda Item 3: | Establish working methodology and<br>future work programme     |
| Agenda Item 4: | Discuss draft water aerodrome<br>standards                     |
| Agenda Item 5: | Any other business                                             |
| Agenda Item 6: | Industry visit to the water aerodrome<br>operation site        |

## 1.6 Working Arrangements, Language and Documentation

1.6.1 The WASWG met as a single body throughout the Meeting. The working language of the meeting was English inclusive of all documentation and this Report. Working Papers (WPs) and Information Papers (IPs) presented at the Meeting are listed in the **Attachment 2** to this Report.

## 1.7 Conclusions and Decisions

Draft Conclusions, Draft Decisions and Decisions of WASWG – Definition

1.7.1 The WASWG recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

- a) Draft Conclusions deal with matters that, according to APANPIRG Terms of Reference, require the attention of States, or action by the ICAO in accordance with established procedures;
- b) Draft Decisions deal with the matters of concern only to APANPIRG and its contributory bodies; and
- c) Decisions of WASWG relate solely to matters dealing with the internal working arrangements of the WASWG.

## **1.8 Terms of Reference of WASWG**

1.8.1 The Terms of Reference of WASWG

### **Deliverable(s)**

- a) Draft Requirements for the design and operations of water aerodromes for sea plane operations.

### **Scope of work**

The following are the broad principles describing the scope of work:

- a) take into account the best practises and proven SARPS available related to water aerodromes and float operations ; and
- b) be consistent with the ICAO Annex 14, Volume I wherever practicable; and
- c) take into consideration international maritime requirements where applicable.

### **Composition**

The Task Force would be composed of experts nominated by Indonesia, Maldives, Sri Lanka, New Zealand and USA. Other APAC States with experience in water aerodromes be invited to nominate experts to the small working group. Additional membership could be invited from other regions if required.

### **Conduct of the work and schedule**

The Task Force shall complete its work in two years' time frame. The work would be carried out by means of electronic correspondence as far as practicable. Minimum amount of face to face meetings would be planned.

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**Agenda Item 1: Election of Chairperson and Adoption of Agenda**

1.1 The Secretariat presented WP/1 which invited the Meeting to elect the Chairperson for the Second Meeting of WASWG.

1.2 Ms. Fathimath Ramiza, CAA Maldives proposed Mr. Atula of CAA Sri Lanka as Chairperson. Indonesia and USA supported the proposal. Mr. Atula was unanimously elected as the Chairperson for the Working Group and he presided over the Meeting.

1.3 The Meeting adopted the following Provisional Agenda:

- Agenda Item 1: Election of Chairperson  
Adoption of Agenda
- Agenda Item 2: Review of the Terms of Reference of  
the Small Working Group
- Agenda Item 3: Establish working methodology and  
future work programme
- Agenda Item 4: Discuss draft water aerodrome standards
- Agenda Item 5: Any other business
- Agenda Item 6: Industry visit to the water aerodrome operation site

**Agenda Item 2: Review of the Terms of Reference of the Small Working Group**

2.1 The Small Working Group endorsed the Terms of Reference with minor changes as at Para 1.8 above.

**Agenda Item 3: Establish working methodology and future work programme**

3.1 The Secretariat presented WP/4 on working methodology and work programme. The WASWG members elected Ms. Ramiza as the Working Group Leader (Coordinator) to steer the Water Aerodrome Working Group Meetings. The meeting also endorsed the following work programme:

	<b>WASWG work programme</b>	<b>Responsible</b>	<b>Date</b>
1	First Face to Face Meeting of the Group to establish working methodology	WASWG	Feb/March 2016
2	Present Preliminary Proposal- First Draft E circulation	Working Group Leader	October 2016
3	Receive Comments from small working group	WASWG/ Working Group Leader	December 2016
4	Present Draft Final Proposal to WASWG Face to Face meeting	Working Group Leader	February 2017
5	Present Final Report with recommendations to AOPSG/1	WASWG/ Working Group Leader	June 2017
6	Present Final report with recommendations to APANPIRG/28	Chair WASWG	September 2017

**Agenda Item 4: Discuss draft water aerodrome standards**

4.1 Indonesia, Maldives, Sri Lanka and USA presented the best practices and requirements followed in their respective countries. The Meeting discussed the first draft sample requirements and invited the members to provide their comments to Chair WASWG, Working Group Leader Ms. Ramiza and Regional Officer/AGA. It was informed that the draft sample requirements will be circulated among the members and suggestions/comments if any will be incorporated by the secretariat before the face to face meeting in Maldives scheduled for February 2017. The draft water aerodromes requirements are placed at **Attachment 3** to this Report.

**Agenda Item 5: Any other business**

5.1 The Meeting expressed appreciation to Sri Lanka for hosting the Second Meeting of WASWG and the members for their participation.

5.2 In closing the Meeting the Chairman thanked the delegates for their support and contribution for the duration of the meeting.

**Agenda Item 6: Industry visit to the water aerodrome operation site**

6.1 CAA Sri Lanka organized a site visit to their water aerodrome facilities operations at Polgolla Water Aerodrome in Kandy and Water Aerodrome in Gregory Lake in Nuwara Eliya.

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## SECOND MEETING OF WATER AERODROMES SMALL WORKING GROUP (WASWG/2)

29 February to 2 March 2016, Colombo, Sri Lanka

## LIST OF PARTICIPANTS

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## LIST OF INFORMATION AND WORKING PAPERS

Paper No.	Agenda Item	Title	Presented by
<b>INFORMATION PAPER</b>			
IP/01	4	Guidelines for Aeroplane Landing Areas	Australia
<b>WORKING PAPERS</b>			
WP/1	1	Provisional Agenda for the Second Meeting of APAC Water Aerodromes Small Working Group	Secretariat
WP/2	1	Election of Chairperson	Secretariat
WP/3	2	Amended TOR of the Small Working Group	Secretariat
WP/4	3	Working Methodology and Work Programme of WASWG/2	Secretariat
WP/5	4	Requirements for Water Aerodromes	Maldives
WP/6	4	Overview of Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5395-1A (Seaplane Bases)	USA
WP/7	4	Case Study of Water Aerodrome Operations in Sri Lanka	Sri Lanka
WP/8	4	Approval Procedure And Standards Used for Water Aerodromes in Sri Lanka	Sri Lanka
WP/9	4	Applicable Case Studies involving Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5395-1A (Seaplane Bases)	USA
Presentation WP/10	4	Introducing Guidance Material on Water Aerodrome's Indonesia	Indonesia
WP/11	4	Draft Water Aerodrome Standards	WASWG Leader

## WATER AERODROME STANDARDS (draft)

### 1 Introduction

- 1.1 ICAO Annex 14 does not differentiate between land and water as a surface from which aircraft can operate; and Annex 14 defines that an aerodrome can be an area of water,
- 1.2 Operations on water differ significantly from those conducted on land, and the licensing criteria for land aerodromes are inappropriate in some areas. Although based on the existing land aerodrome criteria, the different operational and safety risks when operating onto and from water have been recognized and addressed.
- 1.3 The following licensing criteria focus on those licensing factors where water aerodromes differ from land aerodromes. These factors primarily include the physical characteristics of the operating environment, mooring procedures, and rescue and firefighting services; however, one fundamental licensing criterion that requires the licence holder to establish and maintain an appropriate Safety Management System (SMS) remains the same. The criteria should therefore be considered in addition to criteria outlined elsewhere in this document that apply to land and water aerodromes equally.

### 2. DEFINITIONS

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**Aerodrome-** A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and movement of aircraft.

**Aeroplane** – A power-driven heavier than air aircraft deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight

**Fixed Platform** – A platform extending from the shore, on water and supported by pillars to hold it in position, intended to align alongside seaplanes for the purposes of embarkation and disembarkation passengers, cargo, fueling or parking

**Floating Platform** – A platform placed on open water authorized for the purpose of embarkation and disembarkation of passengers or cargo by seaplane

**Water Aerodrome** – A defined area, primarily on water, intended to be used either wholly or in part for the arrival, departure and movement of aircraft, and any building and equipment on ground or water

**Water Runway (Channel)** – A defined rectangular area on a water aerodrome, intended for the landing and take-off of aircraft along its length

**Low water level-** The average low level during that month of the year when levels are lowest or, in the case of tidal waters, the average level of low water springs or lower low waters, depending on the type of tide.

**Movement Area** – The part of an aerodrome to be used for take-off, landing and taxiing of aircraft, consisting of the maneuvering area and platforms

**Response Time**- is the time between the initial call to the Rescue and Fire Fighting Services (RFFS) and the first effective intervention at the accident site by a rescue and firefighting vessel.

**Nature Reserved Designated Area'** -A marine area that is environmentally protected and preserved as a reserve.

**Protected Area'**-A area usually located on the atoll-ward side near islands, which is protected from large waves by the surrounding reef or lagoon.

**Taxi Channel**- A defined path on a water aerodrome, intended for the use of taxiing aircraft

## **WATER AERODROMES STANDARDS**

The Water Aerodrome Standard outlines the minimum specifications for the physical characteristics and obstacle limitation surfaces (OLS) to be provided at water Aerodromes

The standards provide a means of assessment to determine the operational use of a facility.

### **Part 1-Units of Measurement**

Except as specified, the following units of measurement shall be given:

- (1) The water aerodrome elevation shall be measured to the accuracy of one half metre or foot;
- (2) Linear dimensions shall be measured to the nearest one-half meter;
- (3) Aeronautical geographical co-ordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 reference datum.
- (4) WGS 84 shall be used as the horizontal reference system;
- (5) True bearings shall be measured to the nearest degree;
- (6) water depths shall be measured to the nearest foot; and
- (7) tides measured with respect to zero tides.

### **Part II - Water Aerodrome Data**

*Note: This Part contains specifications for the provision of data relating to the Water Aerodrome that is to be determined and recorded in the **Water Aerodrome Operations Manual (WAOM)**. This Part is also used to define the characteristics of water aerodrome data that is to be made available through the aeronautical information publications and/or disseminated through an aeronautical information service.*

### **3.1 Geographic Data**

#### **(1) Geometric Centre**

The geometric Centre shall be determined and given for a water aerodrome to the nearest 1/10th second.

#### **(2) Water Aerodrome Elevation**

Average Mean Sea Level at the water aerodrome

#### **(3) Water Aerodrome Magnetic Variation**

The magnetic variation for the water aerodrome geometric centre shall be determined and given to the nearest degree from magnetic north.

#### **(4) Electronic Navigation Aids**

Where electronic navigation aids are installed for use at water aerodromes, the following information shall be determined and given:

- (a) the geographic co-ordinates of the antenna or radiating centre to the nearest 1/10 second;
- (b) the elevation of the antenna or radiating centre; and
- (c) the bearing of any unidirectional navigation signal (e.g. ILS localizer course).

### **3.2 Water Aerodrome Dimensions and Related Information**

The following data shall be measured or described and given for each facility provided on a water aerodrome:

#### **(a) take-off and landing areas:**

- (i) true bearing;
- (ii) length;
- (iii) width;
- (iv) depth of water; and
- (v) water current.

#### **(b) turning basins:**

- (i) size;
- (ii) length;
- (iii) width or circumference; and
- (iv) depth of water.

#### **(c) taxi areas:**

- (i) width; and
  - (ii) depth of water.
- (d) shore facility:**

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- (i) type; and
  - (ii) depth at shore;
- (e) significant obstacles on and in the vicinity of the water aerodrome:
- (i) location;
  - (ii) top elevation to the nearest (next higher) foot; and
  - (iii) type.
- (f) marking
- (i) location, landing channels;
  - (ii) taxi channels; and
  - (iii) hazardous areas.

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### ***3.3 Provision of Operational Information***

#### **(a) Movement Area and Related Facilities**

- (i) Information on the condition of the movement area and the operational status of related facilities shall be given to the appropriate aeronautical information service;
- (ii) Information of operational significance shall be given to the appropriate air traffic services units;
- (iii) The information shall be kept up to date; and
- (iv) The condition of the movement area and the operational status of related facilities shall be monitored and reports of operational significance or affecting aircraft performance given, in respect of :
  - (A) damage to shore facility;
  - (B) floating debris in the movement area;
  - (C) temporary hazards to include log booms, surface vessels or any other surface or below surface hazard;
  - (D) abnormally high/low water depth;
  - (E) currents; and
  - (F) tidal areas, depth of water at high and low tides or seasonal changes.

#### **(b) Take-off and Landing Area**

Information on take-off and landing area shall consist of:

- (i) the tidal range;
- (ii) the times of high and low tide; and
- (ii) the approximate speed and direction of the current.

## Part IV - Physical Characteristics

### 4.1 Physical Characteristics

#### (a) Take-off and Landing Area

##### (i) General

~~In some cases, the available manoeuvring area will be large enough to provide a choice of take-off and landing direction, dependent upon prevailing water surface and weather conditions. For the purpose of this Chapter, this type of manoeuvring area is termed 'omnidirectional'. However, in other cases, such as on a lagoon or inner harbor, it may be more appropriate to provide a manoeuvring area that caters for take-off and landing in one direction and its reciprocal only, in a direction parallel to the longer sides of the manoeuvring area. This type of manoeuvring area is termed 'bidirectional'. Unless specified otherwise, the certification criteria apply to both types of manoeuvring area.~~

ii) Number and Orientation: The number of water runways at a water aerodrome and their orientation should be such that, for a large percentage of time as practicable but for not less than 95 percent there is at least one water runway for which the surface wind velocity component at right angles to its longitudinal axis will not preclude the landing or taking off of aircraft that the aerodrome is intended to serve.

(iii) Length of water runways: The length of the water runway to be provided should be adequate to meet the operational requirements of the aeroplane for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant aeroplanes.

##### iv) Width

The width of the take-off and landing area should be not less than the value given herein: 60metres for Day operations and 90metres for night operations

##### v) Water Depth

The depth of the water measured at low water level in the take-off and landing area should not be less than 1.8 m (6 feet) or less than 0.3 metres below the hull or floats when the aeroplane is stationary and loaded to maximum takeoff weight.

##### vi) Take-off and Landing Area - Buffer

a protective buffer should extend on each side from the edge of the take-off and landing area to a distance of not less than 30 m (100 ft);

*Note 1: The depth of an area is the minimum depth of water at low water level that is to be expected anywhere in the area.*

*Note 2: Where strong cross winds exist, a secondary take-off and landing area should be considered.*

#### (b) Turning Basins

(i) Turning basins should be provided at both ends of the take-off and landing areas.

(ii) Turning basins should have:

(A) a diameter measured at low water level of not less than twice the specifies minimum width of the corresponding water runway;

(B) a radius no less than 150 feet (45 m); The depth of turning basins measured at low water level should be at least that of the corresponding water runway; and



(C) a horizontal obstruction clearance between the edge of the turning basin and the nearest obstacle of no less than 50 feet (15 m).

**(c) Taxi Channels: Taxi channels should be provided to permit the safe and expeditious handling of aerodrome traffic. Where provided the following provisions of this section apply:**

- (i) ~~Taxiway areas shall be provided when there is potential for conflict with aircraft taking off or landing.~~
- (ii) Taxi channels should have a width, measured at low water level, of not less than 45 m (150 ft).
- (iii) Taxi channels should have a depth, measured at low water level, of not less than 1.8 m (6 ft).

**(d) Mooring Areas**

General- Mooring areas should be provided for the mooring of aircraft and to permit the on and off loading of passengers, cargo and mail without interfering with the aerodrome traffic.

The size of the mooring areas should be adequate to permit expeditious handling of the air traffic at its maximum anticipated density.

The depth of water at the mooring area measured at low water level should be at least that of the corresponding taxi channel.

~~The dock area shall be designed in such a manner as to provide a minimum clearance of 1.8 m (6 ft) between an aircraft wing and any object it could come into contact with.~~

**(e) Shore Facilities**

A dock, wharf, ramp or beach should be provided to permit the emplaning and deplaning of passengers and crew:

- (i) Where a dock or wharf is provided it should:
  - (a) be in a condition that permits constant use without causing injury to persons or damage to aircraft;
  - (b) be attached or anchored in a manner that prevents it from shifting position or becoming detached;
  - (c) have access from the shore that provides for the safe movement of crew and passengers; and
  - (d) have ~~at least two bullrails or~~ provision for appropriate number of tiedown cleats at each aircraft parking position to secure the aircraft.
- (ii) When an aircraft is normally secured in a position where any aircraft component overhangs the dock and constitutes a hazard to the movement of crew and passengers, the hazard shall be clearly indicated by means of
  - (a) cones; and/ or
  - (b) hashed paint markings;
  - (c) in a manner easily identifiable to crew and passengers.
- (iii) Where a ramp or beach is provided it should be:

- (A) built 1.5 times the width of floats or landing gear of the largest aircraft intended to use the facility;
- (B) located in such a manner as to provide a minimum clearance of 1.8 m (6 ft) between an aircraft wing and any object it could come into contact with; and
- (C) constructed with a slope not steeper than 8:1.

*Note: ~~Some amphibian aircraft may be damaged while entering the water if ramp slopes exceed 8:1.~~*

## **Part V - Obstacle Limitation Surfaces and Objects**

This Part establishes a series of Obstacle Limitation Surfaces (OLS) that define the limits to which objects may project into the airspace in order to minimize the dangers presented by obstacles, either during an entirely visual approach or during the visual segment of an instrument approach.

### **5.1 Obstacle Limitation Surfaces**

#### **(1) General**

- (a) The following OLS shall be established for non-instrument day-VFR water aerodromes:
  - (i) a take-off /approach surface; and
  - (ii) a transitional surface.

#### **(2) Take-off/approach Surface**

- (a) The take-off/approach surface shall be either straight or curved.
- (b) The take-off/approach surface shall be established at the end of the take-off and landing area(s) of the water aerodrome.
- (c) The length of the inner edge shall not be less than 60 m (200 ft);
- (d) The inner edge of each approach area is coincident with the end of water runway;
- (e) The elevation of the inner edge shall be the elevation of the water aerodrome.
- (f) The length of the take-off/approach surface shall not be less than 2500 m (8333 ft).
- (g) The slope of the take-off/approach surface shall be a maximum of 5 % (1:20).
- (h) The centre line of the take-off/approach surface shall
  - (i) define the approach path; and
  - (ii) be
    - (A) a straight line;
    - (B) an arc of constant radius; or
    - (C) a combination of a straight line and an arc of constant radius.

#### **(3) Straight-in Take-off/approach Surface**

Where the slope is designed for a straight-in approach

- (a) the divergence of the take-off/approach surface shall be set at 10% starting from the inner edge; and
- (b) the diverging sides of the take-off/approach surface shall meet the vertical portion of the transitional surface at a point 300 m (1000 ft) from the inner edge.

**(4) Curved Take-off/approach Surfaces**

- (a) Where established, a curved take-off /approach surface shall not contain more than one curved portion.
- (b) A curved portion of a take-off/approach surface shall not allow a change of direction greater than 90 degrees.
- (c) Where a curved portion of take-off/approach is provided,
  - (i) the straight portion originating at the inner edge shall not be less than 1300 m (4265 ft); and
  - (ii) the radius of arc defining the centre line of the take-off/approach surface shall not in any portion of the take-off/approach surface be less than 736 m (2415 ft) in accordance with Figure 5.
- (d) A take-off/approach surface incorporating a curved portion shall be established only where guidance such as geographical points or other visual references are available.

*Note: A curved approach is normally established at a non-instrument day VFR facility where it is necessary to avoid obstacles, terrain, noise sensitive areas, or to utilise the airspace above public lands (e.g. freeways, rivers, golf courses).*

**(5)**

Table 1 - Dimensions and Slopes of Obstacle Limitation Surfaces - Water Aerodromes	
	Approach Type
	Non - Instrument/Day - VFR
<b>Take-Off/Approach Surface</b>	
Width of inner edge	Width of take-off and landing area - (120 m minimum)
Location of inner edge	Positioned at the threshold
Divergence	10 %
Length (minimum)	2500 m
Slope (maximum)	5 % (1:20)

<b>Transitional Surface:</b>	
<b>Slope (maximum)</b>	<b>Vertical to 15 m then (1:2) 50%</b>
<b>Height</b>	<b>45 m</b>

**(6) Displaced Threshold**

- (a) Where the integrity of the take-off /approach surface cannot be maintained due to fixed or mobile obstacles, a landing threshold shall be displaced from the normal threshold.
- (b) This displacement shall be established so that the new take-off /approach surface, starting at the displacement, will clear all obstacles.
- (c) Where a threshold has been displaced, the inner edge of approach surface shall be located at the point of displacement.
- (d) Where a threshold is displaced,
  - (i) landing distances shall be calculated; and
  - (ii) declared distances and threshold displacements shall be published in AIP and in a NOTAM, where the NOTAM is published earlier.

**(7) Displaced Threshold Markings**

Where a threshold is displaced permanently or temporarily,

- (a) the threshold displacement shall be marked with floating markers;
- (b) the markers shall be visible from a distance of at least 2 nautical miles; and
- (c) each markers shall be coloured international orange and white or  
the markers shall be alternating international orange and white

~~Note 1: A displaced threshold affects only the LDA for approach made to the take-off and landing area.  
The declared distances for the reciprocal take-off and landing area remain unaffected.~~

**(8) Objects and Obstacles**

- (a) No fixed object shall be permitted on a take-off and landing area or on a take-off and landing area buffer.
- (b) Objects or structures that are located within the water aerodrome boundary shall not penetrate OLS unless;
  - (i) those structures are for air navigation purposes; or
  - (ii) are essential to the safety of aircraft operation; and
  - (iii) are marked, in accordance with ICAO Annex 14, volume I; and
  - (iv) are frangible.
- (c) Except as in 8(d), a mobile object shall not penetrate a take-off/approach or the transitional surface.
- (d) A mobile object shall not be permitted above a take-off/approach or transitional surface, unless procedures are in place to ensure the object is removed during approach and departure operations.

**(9) Other Objects**

- (a) Where an Aeronautical Safety Assessment indicates that an object is hazardous to aircraft located on the movement area or in the air in the immediate vicinity of the water aerodrome, it shall be
  - (i) removed; or
  - (ii) marked; and/or
  - (iv)lightedin accordance with ICAO Annex 14, Volume I.
- (b) The water aerodrome operator shall conduct an Aeronautical Safety Assessment, to establish the required clearances to be used above waterways, lagoons, or harbor.

**Part 6 - Visual Aids for Navigation**

**6.1 Wind Indicators**

- (1) Unless the direction of the wind can be determined by radio, a wind direction indicator should be installed.
- (2) Where a wind direction indicator is installed it must be;
  - (a) of a conspicuous colour;
  - (b) in the form of a truncated cone;
- (3) The wind direction indicator should be;
  - (a) visible at a height of 1000 feet above the indicator; and
  - (b) visible from any portion of the manoeuvring area.

**6.2 Markings**

**(1) Dock Identification Marking**

- (a) Characteristics
  - (i) Dock identification markings shall consist of
    - (A) a triangle;
    - (B) bullrails; or
    - (C) both.
  - (ii) Markings shall be affixed to the upper surface of the dock so as to be visible from 300 m (1000 ft) above the landing area.
- (b) Where bullrails are installed they shall be painted in alternated bands of international orange and white stripes.
- (c) Gangways shall be
  - (i) painted red; or
  - (ii) signage provided indicating seaplane access only.

**(2) Marker Buoys**

- (a) Characteristics

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Marker buoys shall be visible to aircraft manoeuvring

- (i) on the surface of water; and
  - (ii) 300 m (1000 ft) above the landing area
- (b) Take-off and Landing Area Markers
- (i) Except as specified in (ii) at water aerodromes where there is no conflict with marine traffic or marine regulations;
    - (A) Both ends of the take-off and landing area shall be marked with floating markers.
    - (B) The markers shall be visible from a distance greater than 2 nautical miles.
    - (C) Each markers shall be
      - (i) of international orange and white in color; or
      - (ii) alternating international orange and white.
      - (iii) Where it is impracticable to mark the take-off and landing area as specified in (i),
        - (a) guidance such as geographical points and/or other visual references shall be provided to designate the take-off and landing area; and
        - (b) these visual references shall be identified and published.
- (c) Hazardous Areas
- (i) Where shoals or other hazards could endanger an aeroplane, marker buoys shall be installed to clearly indicate the hazardous area.
  - (ii) Marker buoys for delineating hazardous area shall be international orange in color.

### **6.3 Signs**

#### **(1) Prohibition Signs**

- (a) A sign shall be provided and displayed on the dock -restricting the dock to aircraft only.
- (b) A sign shall be displayed on the dock- restricting passengers from the docking area until all aircraft and propellers have come to a complete stop.

### **6.4 Strobe Lights**

Where installed, the strobe lights shall be;

- (a) white, quick flashing;
- (b) located in an area that is easily and constantly seen by both marine and air traffic; and
- (c) radio activated or activated by the water aerodrome operator or designated agency.

## **Part 7 - Visual Aids for Denoting Obstacles**

### **7.1 Objects to be Marked and/or Lighted**

#### **Fixed Objects**

##### **(1) General**

- (a) Objects that are conspicuous by their shape, size or color need not be marked.

## **(2) Types of Markings**

Except as covered under the Marine Act, objects shall be marked in accordance with *regulatory requirement*.

### **7.2 Marking of Objects**

#### **(1) General**

- (a) Except as in paragraph 1 (a) above all fixed objects shall be marked with a conspicuous colour.
- (b) Where it is not possible to colour the objects, markers or flags shall be displayed on or above them.

#### **(2) Use of Colours**

The colour and form of marking displayed on objects shall be in accordance with *Annex 14, Volume I- Aerodromes*.

#### **(3) Use of Markers**

- (a) Markers displayed on or adjacent to objects shall be
  - (i) located in conspicuous positions so as to retain the general definition of the object; and
  - (ii) recognizable in clear weather from a distance of
    - (a) 1000 m for an object to be viewed from the air; and
    - (b) 300 m for an object to be viewed from the ground in all directions in which an aircraft is likely to approach the object.
- (b) The shape of the markers shall be
  - (i) distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information; and
  - (ii) be such that the hazard presented by the object they mark is not increased.
- (c) The colour selected shall contrast with the background against which it will be seen.

## **8. Wildlife strike hazard reduction**

**Note:** The presence of wildlife (birds) on and in the water aerodrome vicinity poses a serious threat to aircraft operational safety:

8.1 The wildlife strike hazard on or in the vicinity of, an aerodrome shall be assessed through an ongoing evaluation of the wildlife hazard by competent personnel.

8.2 Action shall be taken to decrease the risk to aircraft operations by adopting measures to minimize the likelihood of collisions between wildlife and aircraft.

## **9. Lighting of Movement Area**

Text to be drafted

## **10. Rescue and Fire Fighting**

Text to be drafted

## 11. Aerodrome emergency Planning

Text to be drafted

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