



International Civil Aviation Organization

**FIRST MEETING OF THE ASIA/PACIFIC METEOROLOGICAL
ADVISORIES AND WARNINGS IMPLEMENTATION TASK FORCE
(METWARN/I TF/1)**

Bangkok, Thailand, 23 – 25 March 2011

Agenda Item 4: Aerodrome Warnings

PROGRESS ON AERODROME WARNINGS FOR TSUNAMI

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SUMMARY

This paper provides an overview of progress on the provision of aerodrome warning for tsunami, taking into account the existing Australian Tsunami Warning system and for inclusion of tsunami information in aerodrome warnings.

1. INTRODUCTION/BACKGROUND

1.1 Reference is made to APANPIRG Conclusion 20/69 that called for development of Annex 3 provisions and guidance material for the issuance of aerodrome warnings on Tsunami. Subsequently, at METWSG/3 in November 2010 an ad hoc group was formed to provide draft guidance material for consideration at the METWSG/4 meeting in May 2012 (refer METWSG/3 Action Agreed 3/16). In the APAC Region, the CNS/MET SG/14 meeting established the Meteorological Advisories and Warnings Implementation Task whose terms of reference relate to implementation issues associated with meteorological advisories and warnings and aerodrome warnings include Tsunami. This paper provides an overview of progress on the provision of aerodrome warning for Tsunami, taking into account the existing Australian Tsunami Warning system and for inclusion of Tsunami information in aerodrome warnings.

2. DISCUSSION

2.1 Australian Tsunami Warning System

2.1.1 The Joint Australian Tsunami Warning Centre (JATWC) is operated by the Bureau of Meteorology and Geoscience Australia (GA) and provides detection and warning capability for Tsunami in the Australian region. The JATWC detects, monitors, verifies and warns of any Tsunami threat to the coastline of Australia and its offshore territories, 24 hours a day.

2.1.2 In order to assist the community, Tsunami threat levels in Regional Tsunami Warnings are categorised into three levels with required community responses; these have been determined in consultation with emergency management authorities. These are.

- **No threat** – An undersea earthquake has been detected, however it has not generated a Tsunami, or the Tsunami poses no threat to Australia and its offshore territories.
- **Marine and immediate foreshore threat** – Warning of potentially dangerous waves, strong ocean currents in the marine environment and the possibility of only some localised overflow onto the immediate foreshore.
- **Land inundation threat** – Warning for low-lying coastal areas of major land inundation, flooding, dangerous waves and strong ocean currents.

2.1.3 The threat to aerodromes arising out of Tsunami is considered to be from land inundation. While major inundation presents a hazard to people, aircraft, plant and infrastructure, even seemingly minor inundation can effect an aerodrome, for instance through the introduction of foreign object debris (FOD) on operating surfaces such as aprons, taxiways and runways. This can hinder or prevent the operation of aircraft or equipment on the aerodrome for a significant period of time.

2.1.4 The Bureau's guidelines for issuing Aerodrome Warnings for Tsunami state that "an Aerodrome Warning should be issued whenever the aerodrome lies within a threatened area as indicated in any Tsunami Warning issued by the Joint Australian Tsunami Warning Centre". Specifically, Aerodrome Warnings would be issued for aerodromes located within a coastal zone for which the JATWC issues a land inundation threat tsunami warning.

2.2 Content of Tsunami Warning information in Aerodrome Warnings

2.2.1 A JATWC Tsunami Warning for land inundation threat typically defines the coastal region to be affected using the same coastal areas used for routine Bureau Coastal Waters Forecasts, already known to marine users. The message states an estimated commencement time for the threat and estimated duration, and will specifically include information on potential land threat, including threat of major land inundation, together with other marine-related threats.

2.2.2 Upon receipt of a Tsunami Warning which includes the threat of land inundation, an Aerodrome Warning will be issued for aerodromes identified as lying within the coastal region defined in the Tsunami Warning, stating that a tsunami warning has been issued and that land inundation may occur. The estimated commencement time is included and reference to the associated public Tsunami Warning is provided.

2.2.3 An example of the content of an Aerodrome Warning issued for tsunami is as follows:

YBCS AD WRNG 1 VALID 032200/041000Z
AERODROME WARNING NUMBER 1 FOR CAIRNS
VALID 040800/042000 LOCAL
ISSUED 031830Z (040430 LOCAL)
TSUNAMI WARNING HAS BEEN ISSUED.
MAJOR LAND INUNDATION IS POSSIBLE FROM 0800 LOCAL.
ALSO REFER <http://www.bom.gov.au/tsunami/>

2.2.4 Once the threat has passed, or if the Tsunami has not eventuated, the Bureau of Meteorology will issue a Tsunami Warning Cancellation, whereupon the Aerodrome Warning will be cancelled if it is still in force.

2.2.5 An example of cancellation of an Aerodrome Warning issued for Tsunami is as follows;

YBCS AD WRNG 2 VALID 032300/041000Z
CNL AD WRNG 1 032200/041000Z

2.3 Identification of potentially affected aerodromes

2.3.1 JATWC land inundation threat warnings advise people on land in threatened areas to evacuate inland 1km or to an elevation of 10m above sea level. These are general rather than concise criteria which have been found to be reliably conservative measures when applied to typical scenarios.

2.3.2 Aerodromes potentially subject to land inundation threat have been identified by applying these general criteria to a list of aerodromes which currently receive aerodrome warnings, and filtering out those locations above 10m elevation and outside 1km of the coastline.

2.3.3 Regardless of actual criteria used, due consideration should be given to the type and accuracy of coordinate data, if used, in identifying potentially affected aerodromes. For example, the aerodrome reference point (ARP) could be outside the distance criteria for distance to the coastline while the perimeter may be significantly closer and in an area likely to be affected. Equally, coastal data, if used, would need to be of a high enough level of resolution to ensure that some potentially affected locations are not omitted.

3. INDUSTRY FEEDBACK

3.1 A paper and talk were recently presented to the Australian Airports Association at which some preliminary discussion was held. Detailed feedback has been invited and industry input and suggestions will be gathered for consideration over the next two months. Initial comments from industry focussed on:

- The possible inclusion of some additional aerodromes, which do not currently receive Aerodrome Warnings, to receive Tsunami warning.
- With regard to major aerodromes, the current level of awareness by the aerodrome operator of the threat of land inundation and its local effects, e.g. any flood modelling that has commenced or is being proposed.
- With regard to smaller aerodromes, whether there is a general awareness of threat of land inundation by tsunami.

4. ACTION BY THE MEETING

4.1 The meeting is invited to note the information in this paper.
