



*International Civil Aviation Organization*

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

Bangkok, Thailand, 23 – 25 March 2011

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**Agenda Item 4: Aerodrome warnings**

**SUMMARY OF WIND SHEAR DETECTION SYSTEMS  
ACQUISITION WORKSHOP**

(Prepared by the Secretariat)

**SUMMARY**

This paper presents a summary of the Wind Shear Systems Acquisition Workshop held in December 2010 at the ICAO APAC Office.

This paper relates to:

**Strategic Objectives:**

A. Safety

**Global Plan Initiatives:**

GPI-18 Aeronautical information

GPI-19 Meteorological Systems

**1. INTRODUCTION**

1.1 The ICAO APAC Region Wind Shear Systems Acquisition Workshop was held in Bangkok, Thailand from 1-3 December 2010. This workshop was performed as an ICAO Special Implementation Project (SIP) in order to assist State to provide wind shear protection at their aerodromes that satisfy Annex 3, Chapter 7 and Appendix 6. The workshop consisted of forty-one participants from 13 States, IFATCA and ICAO and represented many disciplines that included pilots, ATS, MET, ADMIN and MED. An executive summary is provided in the **Attachment** to this paper for consideration by the task force. The full report is located at [http://www.bangkok.icao.int/meetings/2010/icao\\_wssa/Index.html](http://www.bangkok.icao.int/meetings/2010/icao_wssa/Index.html).

## **2. DISCUSSION**

2.1 The executive summary mainly discusses processes developed by the workshop that are associated with the acquisition of wind shear systems. The acquisition phase utilizes a draft matrix of wind shear detection performance related to wind shear type. The States were enabled to follow this sketch process and determine the most appropriate wind shear detection system(s) for their aerodromes to maintain an acceptable level of safety for their State.

## **3. ACTION BY THE MEETING**

3.1 The meeting is invited to

- a) review and comment on the workshop outcomes; and
- b) provide the meeting any progress in acquiring wind shear detection systems in their State.

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**ICAO Special Implementation Project (SIP)  
Wind Shear Systems Acquisition Workshop  
Executive Summary**

1-3 December 2010  
Bangkok, Thailand

**Objective:**

The workshop was made possible as an ICAO Special Implementation Project (SIP) for the year 2010. The objective of the workshop was to provide States information on different types of wind shear systems in order to assist States in the acquisition of wind shear systems that would satisfy Annex 3, Chapter 7 and Appendix 6.

**Workshop attributes:**

The workshop was attended by 41 experts from 13 States, IFATCA and ICAO and consisted of multiple disciplines that include pilots, ATS, MET, ADMIN, and MED. Mr. PW Chan of Hong Kong, China and Mr. Christopher Keohan, Regional Officer MET, APAC ICAO acted as facilitators of the workshop. Six presentations were considered as well as various group discussions.

**Points to meet the objective:**

The group noted that wind shear encounters in the APAC Region is likely to increase due to the increased traffic, particularly in emerging States, where there is a significant number of thunderstorm days per year. The following issues were discussed to mitigate the safety risks associated with wind shear encounters and the selection of wind shear detection systems:

**SARPs**

ICAO Standards and Recommended Practices (SARPs) were reviewed and noted that ground systems provide wind shear alerts while the MET unit provides wind shear warnings (typically of longer duration wind shear such as low-level jets).

**Aircraft and pilot responses to wind shear**

Wind shear definition was followed by aircraft and pilot responses to the various phases of a microburst and gust front noting that the dangers associated with a microburst in that the pilot's reaction to phase one of the microburst results in an incorrect configuration entering the downdraft combined with the phase of flight (near the ground) where speed may not be compromised by altitude. Gust front dangers such as landing long and a possible roll can occur when a front intercepts an aircraft at an angle. The rapid evolution of wind shear warrants quick sampling and alert updates of one minute as stipulated in Annex 3. The resulting wind shear loss or gain is provided in airspeed loss and gain for ease of interpretation by the pilots.

### Wind shear detection systems abilities and resulting matrix

Detection abilities for various wind shear types was formulated by the group after being briefed on the various systems being used at Hong Kong, China, Japan and the United States. A resulting draft matrix of wind shear detection systems performance for various wind shear types was developed by the group for further consideration by their State. The group noted that wind shear system requirements developed by the State would assist in the selection process and that in some cases multiple systems would be needed to meet the requirements. If multiple wind shear detection systems are used, ATS typically prefers an integration of systems to avoid conflicting information.

### Steps in selection process

The steps in the selection process was modified by the group and based on the presentation by Australia which provided various risk factors associated with selecting a system. This State case study was a result of a B737 incident at the Sydney airport in 2007 which resulted in some damage to the aircraft. The steps developed include:

- determine wind shear types, locations, times and frequency at aerodromes
- determine system requirements
- determine ownership
- utilize draft matrix of wind shear systems as it relates to wind shear type and make a short list of possible systems
- develop risk assessment for each system on the short list using cost, siting, maintenance, lifetime and security
- consider derivative products for ATM efficiency

More specifics can be found in the summary of discussions and presentation provided by Australia (SP4) at the following website: [http://www.bangkok.icao.int/meetings/2010/icao\\_wssa/Index.html](http://www.bangkok.icao.int/meetings/2010/icao_wssa/Index.html) .

### ICAO service to assist in acquisition

The ICAO Regional Officer Technical Cooperation provided a presentation on ICAO TCB's Civil Aviation Purchasing Service (CAPS) which provides assistance on a cost recovery basis to registered Members in both the administrative and the technical aspects of an equipment procurement process. The group considered this option of using CAPS as a safeguard for acquiring a wind shear detection system that would meet their State requirements and Annex 3.

### Workshop results

States were provided sufficient information on wind shear detection systems and developed a draft matrix of various performances for different types of wind shear to assist in developing a short list of systems for further consideration. Steps in the acquisition process include several factors with associated risks for States to consider for those systems on the short list. The use of CAPS would assist States in the acquisition process. Once wind shear detection systems are implemented, the group agreed that ongoing verification and improvement to the system(s) is prudent to maintain the desired level of safety of the State. Lastly, user (e.g. pilots, ATS, operators) participation through user meetings and training is necessary to exploit the full potential of a wind shear detection system.