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**ASIA/PACIFIC METEOROLOGY/AIR TRAFFIC MANAGEMENT  
(MET/ATM) SEMINAR**

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**Agenda Item 3: ATM-tailored meteorological services**

**IMPROVEMENT OF LOW-LEVEL WIND INFORMATION OF JMA**

(Presented by Japan)

**SUMMARY**

The Japan Meteorological Agency (JMA) plans to provide new low-level wind information along flight path for airplanes which is calculated using observations of LIDAR and RADAR. It differs from existing WS information in that it is available all the time in cockpit and also it is visualized in graph. This paper introduces this new information named ALWIN and future plan for operational utilization.

**1. Introduction**

1.1 JMA has provided Low-Level Windshear(WS) Information by LIDAR and RADAR at some of the major airports. The system detects shearline (SL) and microburst (MB), and creates warning messages in text format called WS or MB alert.

1.2 The current system provides information only for severe phenomena, therefore there is no way for flight crews to know moderate or feeble phenomena such as turbulence of small spatial structures including terrain-induced wind. On the other hand, LIDAR and RADAR are able to observe various phenomena not limited to severe events. The system is expected to be improved by fully utilizing observations.

1.3 To use observation data more effectively and improve information on Low-Level WS, JMA started a collaborative research with the Japan Aerospace Exploration Agency (JAXA). JAXA has also developed WS warning system called LOTAS (Low-level Turbulence Advisory System). LOTAS uses ground-based compact RADAR and LIDAR, and provides quantitative and graphical wind information to airplanes via ACARS uplink to enhance situational awareness.

1.4 Based on LOTAS technologies, JMA and JAXA developed new information named ALWIN (Airport Low-level Wind Information). ALWIN was developed with the cooperation of Airlines, namely Japan Airlines (JAL) and All Nippon Airways (ANA).

**2. Overview of Airport Low-level Wind Information (ALWIN)**



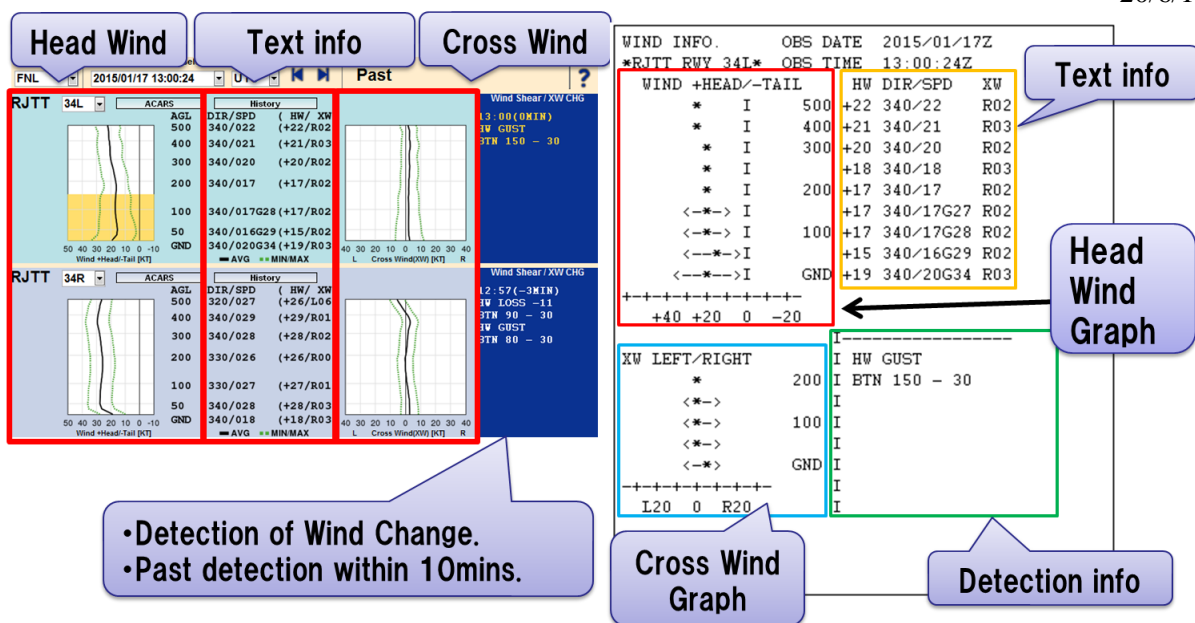


Figure 2 Wind information on flight path. For website (left) and for ACARS (right).

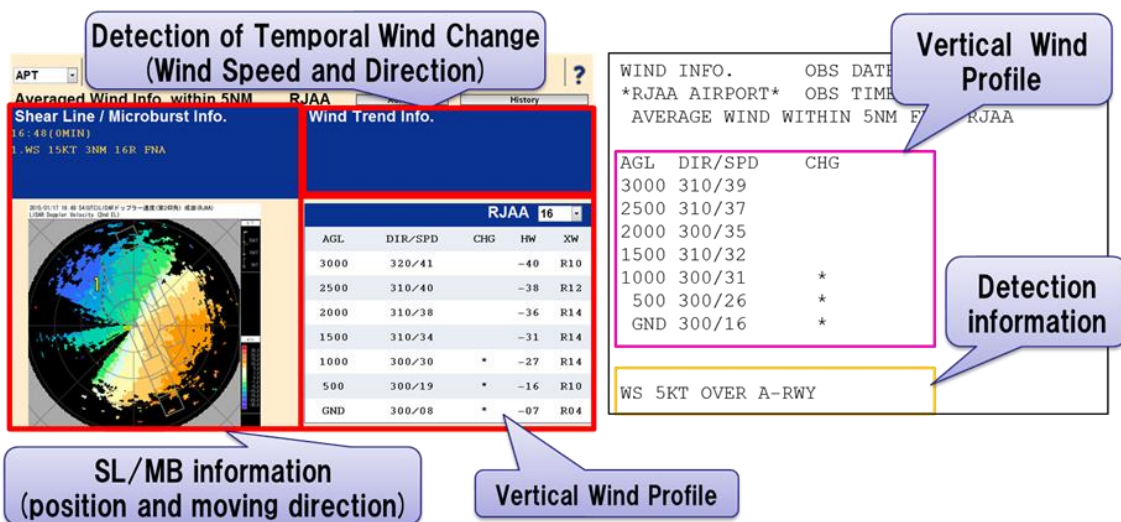


Figure 3 Wind information around airport. For website (left) and for ACARS (right).

2.3 Performance of ALWIN was evaluated by Airlines in a nearly actual operation situation at Narita International Airport. The questionnaire revealed ALWIN was useful for aviation users but there were many requirements for improvement. Some of them are listed below.

- More detailed wind information to know flight path wind condition
- Utilization of RADAR data in rainy condition
- Improvement of information display layout

In particular, the utilization of RADAR is expected. The first prototype of ALWIN did not use RADAR because most of WS is reported in non-rainy conditions (about 70%) and the prototype had a higher priority of using LIDAR. To meet users' requirements, ALWIN plans to be improved.

### **3. A future plan**

3.1 To implement ALWIN in real operation, there are some tasks listed below.

- The current test system should be improved considering users' requirement described above. The following evaluation process is also necessary;
- The current test system uses JAXA's system for data delivery. JMA' system should be equipped with the function;
- To provide ALWIN to users, internal arrangements within JMA are necessary such as considering data distribution routes and preparing the website;

3.2 As of now, ALWIN plans to be equipped with existing operation system which has a renewal plan in April 2016. JMA plans to start ALWIN operation in conjunction with the system renewal.

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