Session 2 – Integration, use cases, fitness for purpose and service delivery
Keynote 1

MET-ATM Integration
Peter Lechner
Chairman, ICAO Meteorology Panel,
Chief Meteorological Officer, Civil Aviation Authority of New Zealand
Neil Halsey
Meteorology Panel Secretariat Technical Officer, ICAO

Meteorological information will always remain critical to the safe and economic operation of the global aviation system. This is partly underscored by the headline book-value of meteorology to aviation, the gross benefit to airlines being in the vicinity of US$20 - 30B (from UK 2012 estimates and applying a global extrapolation and growth methodology). In other words airline income would be reduced by this amount in the absence of aviation meteorology. Removal of aviation meteorology could render global airline operations marginal.

On the other hand, the value to airlines and society of the safe conduct of aviation is inestimable. It is probably greater that the global GDP contribution of US$2.4T. And again, without aviation meteorology that return could probably not be achieved.

When compared to these significant economic and social values, the much smaller, but as yet un-quantified global cost of aviation meteorology is an extremely good investment. However, this does not mean there is no room for development and improvement. There is a revolution in aviation meteorology that is ongoing and gaining pace. We have advanced a long way from the 1950s teletype and low slow aircraft era to fast high altitude, long range aircraft and real-time digitalized meteorological information. The work of this Conference is testament to the continuing and increasing scientific effort on aviation meteorology.

The International Civil Aviation Organization (ICAO) is charged with ensuring the operational provision of aviation meteorology to international aviation. It does this through the assistance of its Meteorology Panel.

The Meteorology Panel collaboratively develops proposals for operational requirements for aeronautical meteorology service provision as an enabling function for a future globally interoperable air traffic management system, and identifies solutions, in co-ordination with WMO, to effectively and efficiently fulfill the requirements through sound scientific and/or technological capabilities. It comprises 28 independent expert members with about 50 advisers to those members. The work is divided amongst five working groups led by highly capable Rapporteurs, and each working group comprising a number of work streams with specific objectives. Many of these people are also members of WMO initiatives so there is a very useful joint pool of information and perspective.

The work of the Meteorology Panel comes through formal requirement from the Air Navigation Commission of ICAO. These requirements are linked to the ICAO Global Air Navigation Plan (GANP) which seeks to make a step change in air navigation reflecting the utilities afforded by global satellite navigation, big data availability and communication, and improved aviation related engineering and sciences.
The Meteorology Panel is making good progress with its responsibilities. An example is the current notable area of work on the development and introduction of a global space weather advisory system in very close collaboration with WMO. This work is undertaken in support of the GANP.

The formal relationship between ICAO and WMO is set out in the Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization (Doc 7475/2) which is currently being reviewed.

There is other work that the Meteorology Panel is undertaking that is driven more by other demands such as the formal requests by non governmental organisations/user representative organisations such as the International Airline Transport Association (IATA), International Federation of Airline Pilots Associations (IFALPA) and International Federation of Air Traffic Controllers’ Associations IFATCA. This includes new work on the transport of sulphur dioxide from volcanoes, the development of regional hazardous weather information systems, WAFS improvements, and a future looking white paper on aviation meteorological services to 2035.

All of this work needs to be thoroughly underpinned by progress in meteorological and related sciences, new scientific capability, and feedback and feed forward with ICAO and aviation meteorological information users. This underpins the importance of this Conference and hopefully supports similar forums that will continue to be promoted by WMO well into the future.

Because the GANP is a central driver for ICAO it is useful to review how it all works to enable more informed collaboration and interaction with its operation.

The GANP is a high level strategic document that sets out the overall plan for air navigation service at the global level covering time periods from the present day out to as far as 2040. The GANP is formally endorsed every three years by the ICAO Assembly (the ICAO equivalent of the World Meteorological Organization (WMO) Congress).

Having described the GANP as a high-level strategic document it is important to note some of the detailed aspects of the document itself. A significant part of the GANP is the presentation of the Aviation System Block Upgrades (ASBU) methodology which provide some detail on the expected way in which the overall strategy will be rolled-out or developed, including some focus on the actual implementation by States, industry and service providers. The ASBU are divided into blocks of time, each representing six years with Block 0 representing the current status (the actual regulatory provisions only represent reality if and when they are implemented successfully). Block 1 represents the immediate future, Blocks 2 and 3 provide less detail as the future unfolds and there is some expectation of a Block 4 looking ahead some distance with little in the way of detail, possibly extending to as far ahead as 2040 in the next iteration. Clearly, in the near term there is scope for near-term planning and resource allocation for all of the parties involved.

Looking a little more closely at the ASBU modules that are described in the GANP we see a list of operational domains that comprise the air navigation world. These domains include trajectory-based operations, air traffic flow management, aerodrome capacity, sequencing, aerodrome collaborative decision making, performance-based navigation procedures and remotely-piloted aircraft. These domains, and others, will require expertise from many areas to progress through the regulatory process over the coming years and importantly for the meteorological community they will require careful consideration of the supporting information that would support any progress and new initiatives.
One of the ASBU modules that is under development relates to meteorology which is labelled as an enabling function alongside the other information domains such as aeronautical information and flight planning. These information domains are bundled together under the system-wide information management domain which in turn relates to the requirements for aeronautical communications. The current development of these meteorology-related modules is determined and driven by the transition to the SWIM environment and by the need for more interoperability allowing integration of MET information in ATM systems.

Moving around into the full circle, the output from the strategic approach of the GANP gives rise to the more detailed aims of the various ASBU modules which ICAO then uses to provide a strategy and development tasks to the Meteorology Panel. This provides a top-down approach to the development of future global requirements which can be used to support internal developments within States and the industry but also by the research community in view of developing the necessary capabilities.

The GANP is published under the ICAO Doc (9750).