

# (WORLD METEOROLOGICAL ORGANIZATION)



## WORLD WEATHER RESEARCH PROGRAMME (WWRP)

## STANDING COMMITTEE ON SERVICES FOR AVIATION (SC-AVI)

*A subsidiary body of WMO's Commission for Weather, Climate, Water and Related Environmental Services and Applications (SERCOM)*

## ONLINE MEETING OF THE AVIATION RESEARCH AND DEVELOPMENT PROJECT – PHASE 2 (AvRDP2) SCIENTIFIC STEERING COMMITTEE

**30 April 2024**

**Meeting minutes**

**Published ..... 2024.**

## 1. OPENING OF THE MEETING

Chris and Piers welcomed the participants and presented the agenda. The agenda covered updates on the demonstration of the prototype aviation products of two airport pairs (London to Johannesburg and Hong Kong to Singapore), the face-to-face meeting, and Ms Hitchcock's presentation on Spatial Patterns of Turbulence near the Thunderstorm.

The agenda for the meeting included:

1. Presentation on Spatial Patterns of the Turbulence near the Thunderstorm by Stacey Hitchcock
2. Updates on the demonstration products on the two airport routes (LHR-JNB and HKG-SIN)
3. AvRDP2 face-to-face meeting
4. Feedback from the SC-AVI Expert Team Meeting
5. Next steps

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### 1. Ms Hitchcock's presentation.

- Ms Hitchcock discussed her research work on spatial patterns of turbulence near thunderstorms. She provided background on FAA guidelines for flying through or around storms and noted that despite newer data, the guidelines have not changed much in 60 years.
- Her research used aircraft turbulence reports (EDR data) from 2009-2017, along with radar data, to analyze turbulence risk near storms.
- The analysis showed that the risk of moderate turbulence is double the background up to 70km from storms, and the risk exists above echo tops regardless of separation distance.
- She noted that convective regions pose significantly higher risks than stratiform regions, but the risk above stratiform is still almost 10 times the background.
- The results further showed that environmental factors like wind speed/shear influence risk levels and distances. Risk increases closer to the tropopause.

### 2. Updates on the demonstration products on the two airport routes (LHR-JNB and HKG-SIN)

#### **Update on LHR-JNB pair (Piers & Morne)**

- Engagement with UK air traffic controllers to get feedback on the usefulness and usability of convective forecast products for long-haul flights is ongoing.
- Potential analysis of past flight data from British Airways to retrospectively demonstrate the value of turbulence forecast information and how it could impact routing decisions is being considered.
- Jacob's work on understanding how convection information impacts aircraft routing will be summarised. An MSC student will be assigned to extend this work over the coming months.
- Given long flight planning timelines, using products in real time for the LHR-JNB long-haul route presents challenges. Still, there are opportunities to get feedback from embedded forecasters at airline dispatch centres or operation control centres and do retrospective analyses.
- The verification of products for this route would likely focus on one-dimensional analysis that compares forecasts to actual reported turbulence encounters and deviations along the flight path.

#### **Update on HKG-SIN pair (Ping)**

- Real-time data exchange program has been initiated with the Singapore Meteorological Service to provide convective nowcasts and model forecasts.
- The process of developing a blended nowcast product that combines satellite, radar, and model data for the region is ongoing.
- User-friendly web interface and a possible EFB application for pilots are under development. The next step is to find pilots to test products in real time and gather feedback through surveys.
- There is a potential to engage Singapore Airlines in addition to the authorities.
- Future plans include product intercomparison, verification case studies, and the use of trajectory prediction tools to simulate impacts.

### 3. AvRDP2 SSC 3rd face-to-face meeting

- Dates were confirmed as September 16-18, 2024, at the UK Met Office in Exeter, UK.
- Chris noted that the September meeting is critical to cap the research phase and decide on 2025 demonstrations.
- Attendees would include project members and potential guest forecasters/experts, and a hybrid online option was discussed.
- Chris and Piers will work on the agenda; it will likely include:
  - ✓ Progress on the ongoing work
  - ✓ Engagement of relevant stakeholders
- A long verification session was requested to be included to discuss progress.

### 4. AvRDP2 feedback from the SC-AVI Expert Team Meeting

- Piers, Ping, Morne, Michiko and Danice attended as members of this expert team.
- They gave a brief presentation on the progress of the two flight routes being studied in this project.
- Verification was briefly discussed but more work is needed, and issues with user involvement were mentioned.
- A few questions arose about the possibility of updating products in real-time and blending northern and southern hemisphere data for the London-Johannesburg route.
- It was agreed that project progress would be presented at October's WMO aeronautical meteorology scientific conference (21-25 Oct 2024, at WMO premises).

### 5. Next steps

- Chris and Piers will work on the 3rd meeting agenda and include a long verification session for the September meeting.
- Piers will check if the UK Met Office can issue an invitation letter to host the September meeting.
- Members who will not travel to the UK for the September meeting should inform Helen so that she can assist with preparations.
- Presenting a project progress update at the upcoming WMO aeronautical meteorology scientific conference in October.
- Ping will continue to engage with Singapore authorities and airlines on the Hong Kong-Singapore flight route trial plans.
- Piers will coordinate the summation of Jacob Cheung's initial trajectory prediction work for further discussion at the September meeting.

## 2. **NEXT ONLINE MEETING:** F2F from 16-18<sup>th</sup> September 2024 in the Exeter, UK

AvRDP2-SSC-actions	Who/Due date
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○ F2F meeting	Chris and Piers by 15 <sup>th</sup> June
○ LHR-JNB and HKG-SIN to refine blended forecast products ahead of pilot demonstrations.	Starts in May 2024
○ Gathering feedback from airlines	Ping
○ Options for real-time forecast demonstrations with air traffic controllers over the busy northern summer period.	Piers
○ Finalise plans for the in-person 3rd SSC meeting at the Met Office in September (16-18).	Piers and the WMO secretariat
○ Feedback on verification methodologies in line with Ramon's discussions on understanding impacts and benefits.	Ramon and All
○ The summation of Jacob Cheung's initial trajectory prediction work	Piers
○ Send a confirmation regarding attendance at the face-to-face meeting taking place in Exeter, UK.	All - by 20 <sup>th</sup> May
○ AvRDP2 presentation to AeroMetSci-2024 conference in October	SSC co-chair/SSC member

## LIST OF ATTENDEES

### 1. SSC members

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<sup>[1]</sup> Co-chair of AvRDP-SSC

### 2. WMO Secretariat

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WIGNIOLLE, Stephanie	BROCK, Greg Head, Services for Aviation Division, Services Department	<a href="mailto:swigniolle@wmo.int">swigniolle@wmo.int</a>

### 3. List of apologies/absentees

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### 4. Invitees

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