

RTCA Paper No. 214-14/SC231-004  
October 2, 2014

**MEETING MINUTES  
THE SECOND MEETING OF SPECIAL COMMITTEE 231**

**TAWS**

**Date:** September 30, 2014

**Time:** Meeting called to order 09:00  
and adjourned 12:30

**Place:** RTCA Inc.  
1150 18th Street NW Suite 910  
Washington, D.C. 20036

**Co-Chairmen:** Yasuo Ishihara                      Rick Ridenour

**Designated Federal Official:** Charisse Green

**Secretary:** Zach Reynolds (temp: Gary Ostrom)

**Welcome / Introduction / Administrative Remarks:**

- Meeting called to order with a brief self introduction of each of the 17 attendees.
- S. Bousquet provided a welcome to RTCA
- Attendees:

<b>Name</b>	<b>Company/Agency</b>
Baker, Kirk	Federal Aviation Administration
Bousquet, Sophie	RTCA, Inc.
Bulger, Chip	Federal Aviation Administration
Fleury, Stephane	Thales
Green, Charisse	Federal Aviation Administration
Kapytov, Vasily	JSC "International Aeronavigation Systems"
King, Matt*	Alaska Airlines



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Ishihara, Yasuo	Honeywell International, Inc.
Johnson, Steve	Honeywell International, Inc.
LE CANN, Alexandre	Airbus SAS
Ostrom, Gary	Honeywell International, Inc.
Ridenour, Rick	ACSS
Sadilov, Vsevolod	JSC "International Aeronavigation Systems"
Stevens, Aubrey*	Delta Air Lines, Inc.
Tubb, Nicholas*	The Boeing Company
Vafiades, Monica	U.S. Air Force
Zapoluch, Steven	Garmin
*Attended by Phone	

**Tuesday, 30 September**

**Agenda Overview:**

- R. Ridenour outlined each one of the current Agenda Items

**RTCA:**

- S. Bousquet requests that the audience review the RTCA Proprietary Reference Policy slide.

**DFO:**

- C. Green provided opening remarks.

**Current Committee Scope / Terms of Reference (TOR):**

- Presentation #1: R. Ridenour presented a slide with the current Terms of Reference for quick review. Of note: A single TAWS MOPS document (DO-3xx) will be created which will cover both legacy GPWS modes as well new TAWS modes.
- Y. Ishihara, briefed what has occurred in the working group. Indicated that no changes have been made but work is being done to combine the MOPS documents into a single document.

**IANS Presentation:**

- Presentation #2: V. Sadilov, of JSC "International Aeronavigation Systems", gave a presentation of his company's capabilities. The presentation provided an overview of the various aviation/aeronautical products and technologies. Their company develops TAWS functional software module for the integration

into systems. The presentation provided details of the Enhanced Terrain and Obstacles Awareness system.

- R. Ridenour asked V. Sadilov if during their research if there are improvements they see. V. Sadilov indicated that they believe Mode 1 and Mode 2 can be combined.
- Y. Ishihara asked that with the enhancements they have made can they meet the MOPS? They indicated yes. Yasuo stated that MOPS are minimum performance standards and we should avoid adding specific performance requirements.
- For Mode 1, S. Johnson indicated that it would be better to include test cases that verify the performance of the system. C. Bulger indicated that this is a good approach to not include a particular descent profile into the performance requirements.

## **RNP Curved Path Discussion:**

- R. Ridenour introduces the RNP topic and opened up the discussions to get operational experience from industry, airlines, and FAA. Y. Ishihara asked if any manufactures have designs to specifically address RNP. R. Ridenour indicated that they have solved particular cases but not a general design approach.
- S. Johnson indicated that a key piece of the safety challenge is to insure the separation between the surveillance and navigation. Engine out RNP procedures are particularly challenging. Don't want to respond to a TAWS alert in some situation as the safe route is the RNP path.
- R. Ridenour, questions, what level of protection is required? To be on RNP procedure there are already protections in place. What level of protection is needed without producing nuisance alerts?
- Y. Ishihara question to FAA, are we approaching this to have timely alerting or allow manufactures to deviate? C. Bulger commented that for RNP curve paths if there is a way to eliminate alerts for these approaches by providing allowances in the MOPS to get rid of these alerts this should be done.
- S. Johnson notes he doesn't believe that RNP approaches are created with compatibility with the TAWS MOPS.
- M. King, indicated that they have worked with Honeywell with on RNP approaches and small changes were made, updates to the terrain database, that resolved issues and he doesn't see a lot of problems in the area.
- For the case of adding high resolution terrain to solve the issue, C. Bulger commented that it is possible that installation limitation

might suggest that high resolution be required. He indicated that if the MOPS could give allowance for RNP that would be ideal however he understands there are constraints.

- S. Johnson commented that just having a RNP bit that indicates on path would not be enough unless MOPS were updated to just reduce alerting by say 25%. Designing this for future the TAWS should consume the flight path information. Brings up what is the escape maneuver?
- S. Johnson also noted that maybe language could be added “In support of RNP approaches the vendor could consider the use of higher resolution terrain database.”
- M. King commented that maybe it doesn’t belong in the MOPS.
- R. Ridenour indicates that a test requirement might be put in place to reduce alert time during the RNP.
- K. Baker made the comment: maybe a way to do this is clearly delineate the limitation of TAWS near the runway.
- At a minimum add test cases for RNP approaches (curve path). Possibly RNP and Low RNP test cases.
- C. Bulger summarized the discussion as follows: both operators and vendors are not asking for this and they don’t have proposal for this issue.

**Action:** The goal is to eliminate deviations. Vendors go back and think about your systems and if you believe you would need to ask for a deviation what would you add to the MOPS to address this. Come back with a proposal. Maybe a simple solution will come to light.

### **Discussion of NTSB recommendation of the 2013 UPS crash in Birmingham, Ala.:**

- S. Johnson indicated maybe we add the UPS accident as a test case in the MOPS. Define test cases closer to the runway. Don’t want to define an envelope to address the situation. S. Fleury, agrees adding test cases is the way but believes we need to collect data for reaction time. Maybe this would help decide if we have changes needed for the envelopes.
- C. Bulger agrees, test is one way to address this but may need requirements writing. However, they don’t need to be so prescriptive to drive design. FAA would like the committee to look at test cases and look to see if there are any improvements to the PDA requirements. Include Birmingham and maybe the Tallahassee accident to the test cases.

- C. Bulger asks that the committee consider VNAV approaches “dive and drive” descent rate below the calculated glide path. Is there additional work that could be done on Mode 1? Are there enhancements that could be made to Mode 1 to cover this situation?
- S. Fleury, commented that it might be good to look at cases close to the runway to understand the allowance we give to the pilots without producing nuisance alerts.
- S. Johnson notes that NTSB study suggests that a warning is needed to require pilot action to prevent this accident. Requirement could be updated to add a caution or warning for the test cases added for the accident scenario.
- Y. Ishihara raises development cost concern. C. Bulger indicated that this is recommendation from the NTSB and that it should not put extra burden on the manufactures. Consider PDA, adding test cases, and caution and warning alignment.
- R. Ridenour indicates the TOR may need to be updated to add this specific item.
- C. Bulger wants the committee to explore the TSO 500 foot callout requirement. Can it be 400 or 500 foot callout? Allow flexibility in the requirement. Also suggests that when following vertical guidance the equipment doesn’t need to provide alert.

**Discussion of Date and Time of Next Meeting:**

- Committee reviewed the schedule (Plan) slide to decide on a date. Rick noted that this was a notional plan. Committee agreed to **6-8 January 2015** for the next Plenary Review. Y. Ishihara said that based on progress the rest of the schedule will be firmed up.