Research, Engineering and Development Advisory Committee (REDAC) Subcommittee on Airports Fall Meeting September 10-11, 2013 National Airport Pavement Test Facility William J. Hughes Technical Center, Atlantic City, New Jersey

Meeting Minutes

September 10, 2013

Meeting opened at 9:00am with opening remarks by Mr. Chris Oswald (Subcommittee Chair) and introductions. Chris welcomed members and thanked everyone for attending.

Mr. James White, the designated Federal Official, was unable to attend or participate due to a medical emergency. Dr. Satish Agrawal and Chris Oswald provided a general update on the sequestration, the possible government shutdown at the end of the fiscal year (FY), and its potential impact on the Airport Technology Research (ATR) program. It was also mentioned that it is likely that FAA will be operating under a full year continuing resolution in FY 2014 that would keep ATR funded at the FY 2012 level. It is also likely that the FY 2015 and FY 2016 budgets will not propose any increase in Airport Technology Research.

Dr. Eric Neiderman, Acting Manager of the Aviation Research Division, provided introductory remarks and more discussion on sequestration and the potential long term effects. He briefed the REDAC goals, changes, and the importance of the Subcommittee's input on ATR. He briefly mentioned some of the challenges that other groups at the Technical Center were having with the sequestration and the uncertainty with the government funding situation.

Satish welcomed the group, gave an overview on the FY 2014 budget and discussed the status of the 10-year Airport Technology Research Plan, as well as the development of 10-year plans for both Airport Pavements and Airport Safety. Satish also provided an updated on the Heavy Vehicle Simulator (HVS) facility and the project for extending pavement life to 40 years. He said the heated pavements and aircraft braking projects will be highlighted later in the meeting.

Gloria informed the Subcommittee that she has a database for the REDAC recommendations, and that it should be easier for members to review and keep track of the FAA responses to the recommendations. In addition, all presentations and briefing material will be uploaded to this web site for easier access.

Jim Patterson went through each recommendation and its status.

Jim Patterson then provided an overview of the Airport Safety Section, ANG-E261, which included discussions of FY 2013-15 budgets, the suggestion to create a new RPD to cover airport technology databases and software design, safety resources, the new safety 10-year plan, and report publications. The Subcommittee indicated that they were in agreement with the suggestion to create a new RPD, as it did make sense considering the large number of databases and software programs that are being managed by the ATR program. ATR will brief this new RPD separately at the 2014 spring meeting.

C. Oswald offered a general comment regarding the how the Subcommittee could get more involved in the scope of project requirements and plans and requested that project plans be

shared with the Subcommittee. Suggesting that from a risk management perspective, bringing the Subcommittee in on the front end of project planning process may lessen criticisms on the back-end. He specifically recommended the development of RPD 156 as an example of potential upfront interaction between ATR and the Subcommittee.

Presentation *Heated Pavements* | **Presenter** *Don Barbagallo*

Discussion – Don Barbagallo provided an update on the status of research work being conducted on heated pavements. In addition to the geothermal-heated airplane parking stand construction currently underway at Binghamton, three additional research projects were discussed. The first research project will provide an economic analysis of potential heated pavement sites at three commercial airports and three general aviation airports. This analysis will be conducted using currently available pavement heating technology and will include cost/ benefit analyses at selected locations. The other two projects will explore new technologies that could make heated pavements more economical to operate. The first project involves super hydrophobic coatings used either alone or in conjunction with conductive concrete to delay formation of ice particles on pavement surfaces. The second project involves the use of phase change materials to store and release energy to delay or prevent icing of the pavement. Questions and discussion included areas on an airport where the use of heated pavements might be practicable (i.e., high-speed exits of taxiways and airport parking gates), surveying airports on snow removal costs, benefits to airlines, maintenance costs, the use of advanced materials, and target costs.

Conclusion – The subcommittee recommended the FAA proceed with Binghamton evaluation and with the economic analysis at given airports. While some of the subcommittee members were in favor of research using advanced materials for heating pavements, the general consensus was that limited research dollars should be invested until an economic case can be made for heated pavements.

Presentation Aircraft Braking Study | **Presenter** Joe Breen

Discussion – Joe Breen provided an update on the aircraft braking study and presented data that was collected during testing on both dry and wet pavement surfaces. In the 2013 spring meeting, the Subcommittee suggested that they would like to see results of the wet and dry testing to prove that the research aircraft can produce meaningful results. The Subcommittee indicated that they were very pleased with the results and accomplishments, and recommended that the effort continue through the winter. They would like to see the results of testing on contaminated surfaces by the 2014 spring meeting.

Dennis Filler, Director of the FAA Technical Center, joined the meeting and provided a brief personal introduction to the Subcommittee. He mentioned his goal bringing all of the technical assets available at the Technical Center together to promote the Center as a premier research facility. He indicated that he greatly values the contribution of the ATR program and wants to make sure that he publicizes it as much as he can. He thanked the Subcommittee for their support, citing the Airports Subcommittee as one of the best he has worked with.

Presentation Aircraft Noise and Annoyance, Problematic Geometry, Safety Database, APCH Hold/RSA Marking, and Turtle Turf | **Presenter** Lauren Vitagliano

Discussion – Lauren Vitagliano provided a briefing on RPDs 133, 141, 142, 149 and 151. Specific projects included: EMAS Marking & Signage, Approach Hold/RSA Marking & Signage, Taxiway Deviation, Gopher Tortoise Mitigation, Airport Safety Database, Problematic Taxiway Geometry and Aircraft Noise & Annoyance. The Subcommittee was agreeable to the updates provided for the visual guidance projects and suggested vehicle drivers participate in field evaluations in addition to pilots. Previously listed under RPD 151, the Airport Safety Database was briefed as its own new RPD 141. The briefing generated a lot of discussion and prompted the Subcommittee to ask "When do databases stop becoming research and become operational?" It was explained the objective of this database was to be a tool for the Office of Airports to use mitigation efforts, new research, etc. Another new RPD was introduced - RPD 142 Problematic Taxiway Geometry. The Subcommittee was pleased to hear the briefing on this much-needed major initiative. The findings of this effort will assist in developing a 10-year improvement program to correct problematic geometry at our nation's airports. And lastly, the Subcommittee was briefed on RPD 149 in which the Office of Airports is working with the Office of Environment and Energy to create a new dose-response curve based on updated data to represent the airports in the United States.

Conclusion – The subcommittee suggested that they may make a recommendation for the FAA to make sure the Safety Database that is being developed is done in coordination with other FAA lines of business. They also indicated that they may want additional clarification on the purpose of the safety mitigation plans that were briefed. The Subcommittee is concerned that airports have not had the opportunity to review the suggested mitigation techniques, so there would likely be push back from industry.

Presentation *Visual Guidance* | **Presenter** *Don Gallagher*

Discussion – There was discussion on LED lights and coordination with the manufacturers about installing provisions to make the LED lights more visible by artificial vision devices. Research being conducted by the Rensselaer Polytechnic Institute on lifespan of LED fixtures was briefed, along with new LED approach lighting R&D that will be conducted at the Technical Center in cooperation with FAA Flight Standards.

The first day adjourned at 4:15pm.

September 11, 2013

The meeting resumed at 9:00am

Presentation Aircraft Rescue Fire Fighting | **Presenter** Keith Bagot

Discussion - Keith Bagot provided an update on the three RPDs covering Aircraft Rescue and Fire Fighting (ARFF), Composite Material Fire Fighting and Operation of New Large Aircraft (NLA). The status of recent research report reviews and releases were discussed as well as updates on current projects such a crash simulation for predicting fuel release, bio-fuels, composite material fire test protocol development and cargo aircraft fire fighting. Also discussed were ideas for better disseminating all of the research reports out to the industry. Ideas such as portable data storage media distribution at work shops and conferences and potential email subscription notifications were discussed.

Presentation Visual Guidance and Low Cost Surface Surveillance | **Presenter** Robert Bassey

Discussion – Robert Bassey provided an update on the status and direction of the Airport Technology Research Taxiway, Electrical Infrastructure, Airport Construction Signs and Low Cost Surface Surveillance research projects. The subcommittee expressed their support and was pleased with the progress being made in these research efforts.

Presentation *Wildlife* | **Presenter** *Ryan King*

Discussion – Ryan King provided an overview of RPD 150 Wildlife Hazard Mitigation R&D Program, focusing on 1) Data and Information Systems which support assessment of wildlife hazards, help steer research, and support the knowledge base necessary for development of standards for managing wildlife hazards at airports; 2) Research of Wildlife Management and Control methods and techniques that result in guidance for specific best practices that can be applied on airport property and in the vicinity of airports to reduce hazardous wildlife activity; and 3) Research of Technology used to mitigate wildlife hazards and improve airport safety. Special attention was paid to the current shift in research focus from assessment of avian radar systems for use by airport wildlife management personnel toward application of avian radar in the air traffic control environment. The presentation ended with a look at the potential of using existing airport sensors such as cameras, foreign object debris detection systems, low cost surveillance systems, avian radar, and weather radar in a composite manner that enables coordinated functionality among disparate systems to serve various end users. The Subcommittee indicated general agreement with the direction and scale of this R&D program.

Presentation Airport Planning | **Presenter** Holly Cyrus

Discussion – Holly Cyrus provided a review of Airport Planning, RPD 132. She reviewed the contract funds for FY 2013 (\$535), FY 2014 (\$500), and FY 2015 (\$500). She discussed the Airport and Airspace Simulation Model enhancements: Engine Version 3.9 was released in September 2012 with 19 additional enhancements. Engine Version 4.0 was released in March 2013 with 30 additional enhancements. Engine Version 4.0 addressed a major deicing upgrade,

also simulating multiple flight levels on one node-link level, and miscellaneous bug fixes. Engine Version 4.1 will be released the end of September 2013 with about 27-29 additional enhancements. Engine Version 4.1 addressed the dynamic taxiing enhancements and dynamic gate re-evaluation, as well as the new PDARS output format for animation software, also airspace movement and blocking enhancements, also the new output tables to validate runway occupancy data and airspace separations, also improved gate logic for efficient gate use, and various bug fixes.

The FAA's Airport and Airspace Simulation Model is being used by Landrum and Brown for San Francisco and Denver airports. The objectives of these studies are: SFO – Analyze various scenarios to limit delay during runway construction and DEN – Simulate deicing improvements.

There were no questions, as the Subcommittee was a bit pressed for time and needed to move on to the pavement portion of REDAC.

Presentation Overview of Airport Pavement Branch | **Presenter** Jeffrey Gagnon

Discussion – Mr. Jeffrey Gagnon provided an overview of the progress of the 2013 pavement projects and changes to the plans for FY 2014. Also covered were the workshop performed by the branch and cooperation with the airport pavement industry.

Conclusion – The Subcommittee commented that the FAA provides a good resource to the industry and consultants who work with the specialized field of airport pavements.

Presentation 40-Year Design Life Initiative | **Presenter** Dr. David Brill

Discussion – Dr. Brill clarified that the 40-year life of asphalt pavement will include major maintenance cycles to get pavement back above a given lower limit. 40-year life must address both structural condition and functionality of the pavement. Issues about roughness would fall under functionality and criteria would have to be developed. It was suggested to look at issues concerning high tire pressure and shoving of pavement. What types of aircraft will be used to plan for 40 years?

Conclusion – The Subcommittee concluded that their recommendation on the 40-year life can be closed. A possible new recommendation may suggest that the FAA work with the concrete and asphalt industries to develop indexes for assessing pavement condition with regard to its expected life.

Presentation FAA PAVEAIR & NDT Update | **Presenter** Al Larkin

Discussion – Al Larkin updated the committee about the new changes being planned for FAA PAVEAIR. Monte Symons cautioned that with the addition of the proposed features, PAVEAIR may be at risk to be more of an analysis tool than an airport pavement management application.

Conclusion – Following some discussion, the Subcommittee concluded that having data assembled in one application was very helpful and could be a real asset in the future.

Presentation *Pavement Roughness Update* | **Presenter** *Al Larkin*

Discussion – Al Larkin discussed the progress of the roughness project and the simulation work. Gary Mitchell inquired about the capability of the California Profilograph to profile for distances smaller than the minimum in the Advisory Circular 150/5370, paragraph 501 5.2 (1/10 mile).

Conclusion – Jeff Gagnon stated that the FAA should be addressing the questions/comments on Gary's document regarding concrete pavement acceptance in the new revised P-501 specifications due out with the next two months.

Presentation Field Instrumentation Projects | **Presenter** Dr. Navneet Garg

Discussion – Dr. Garg discussed the strain measurements of Hot Mix Asphalt (HMA) pavement at Newark Liberty International Airport. He also discussed issues about the new innovative pavement crack detection techniques using carbon-nanotubes and self-powered wireless active sensing systems (nano-technologies).

Conclusion – The subcommittee felt the data looks good and the project should continue collecting data.

Presentation Facility Update | **Presenter** Don Barbagallo/Ryan Rutter

Discussion – The latest plans for CC7 HMA construction and testing were discussed. The project will test perpetual pavements on the north side of test pavement and pavement overloading on the south side. Reflective cracking test rig plans were also discussed. The next round of testing will occur in the winter and will evaluate the effects of a polymer modified interlayer to reduce/delay reflective cracking. Information was also presented on upgrades to the test vehicle and facilities.

Conclusion – The subcommittee commented that the testing being proposed will be valuable to the airport paving community.

Presentation Construction Update | **Presenter** Murphy Flynn

Discussion – There was discussion about status of the construction of the HVS-A facility, acceptance of the HVS-A and construction of a test pavement for that purpose and an update on Construction Cycle 7 (CC7). Difficulties with CC7and the problematic weather that was encountered were detailed.

Conclusion – HVS-A and Safety Technology Building construction contract has been awarded with construction beginning this fall. The subcommittee commented on the perseverance needed during construction of CC7.

Presentation *Pavement Software Upgrades and Update* | **Presenter** *Dr. David Brill*

Discussion – Dr. Brill covered the latest updates to the COMFAA and FAARFIELD programs, including the conversion of COMFAA 3.0 to a Windows Presentation Foundation platform. New models in FAARFIELD 1.4 beta include a revised flexible pavement design incorporating

CC3 and CC5 results, and a new feature for computing compaction requirements automatically. Deployment of FAARFIELD 1.4 would require some changes to the existing AC.

Conclusion – There was a suggestion which advised against relaxing the requirements on brittle concrete mixtures without some qualification on aggregate composition and/or restriction on cement content.

Next Meeting – April 1-2, 2014 at the William J. Hughes Technical Center, NJ.

Time Adjourned: 1:00p.m.

Attendance

Members: Chris Oswald (Chair) Barbara Busiek Jim Wilding Paul Martinez

Flavio Leo Monte Symons Mike Rogenski Stephanie Saracco Steve Jangelis Gary Mitchell

Other Attendees: Eric Neiderman, FAA Peter Sparacino, FAA Lauren Vitagliano, FAA Murphy Flynn, FAA Nick Subboth, FAA

Satish Agrawal, FAA Don Gallagher, FAA Mike DiPilato, SRA Jennifer Klass, SRA Keith Bagot Richard Kessel, ALPA Ryan King, FAA Qingge Jia, FAA Al Larkin, FAA