



Minutes of the 13 May 2010 Meeting of the North American SIMMOD Users Group

1. Welcome

Whereas, Toni Trani, the chair of the NASUG had sent his regrets that he would not attend and was no longer active with Simmod, Eric Boyajian moderated the meeting. The meeting convened at 9:00am at Metropolitan Washington Airport Authority (MWAA) offices at Washington Dulles International Airport. Eric welcomed everyone to the meeting, and each participant introduced her- or himself.

2. Agenda

The agenda was reviewed and accepted without changes.

3. Minutes of the Previous Meeting

Belinda Hargrove prepared the minutes of the 12 March 2009 meeting and submitted these to the group.

4. Enhancement Projects at Washington Dulles

Mike Hines provided a very thorough overview of enhancement projects at Washington Dulles International Airport (IAD). He started his presentation with a 15-minute video documentary of the history of both Washington Reagan National Airport (DCA) and IAD.

He then followed with a discussion of the capital construction program to enhance IAD. This program has been implemented in two major phases: D1 and D2. The significant efforts undertaken during the D1 phase was to expand the terminal. This was launched at the time that MWAA was created. The main terminal expansion was completed 1996. Further work added concourses B and C.

The D2 phase (2001-present) includes many other improvements such as a an expansion of concourse B, a fourth runway, a new air traffic control tower, a new deicing area with underground storage of fluid, a doubling of the international arrivals building, and the AeroTrain that replaces some of the existing mobile lounges.

Concourse B now has four gates that accommodate A380 aircraft, and operations have been tested.

During the development of the airport, it was initially thought that runway 1R/19R would be the third to be constructed; however, studies (including those performed with Simmod) indicated that the 12/30 crosswind runway should be next. Consequently, runway 1R/19R was completed in November 2008. To build this fourth runway, the airport had to buy land to the east to achieve the 4,300 feet of separation with runway 1C/19C.

The new tower has clear views of all runways — including a planned fifth that will be parallel to runway 12/30. A new concourse will be built around it and AeroTrain stops have already been constructed to reach this future concourse.

The new security mezzanine was build to specifications of the Transportation Security Administration. It is working fairly well after some modeling and analysis to understand and remedy the kinks.

5. FAA Development Activities

John Zinna presented the current status of FAA Tech Center's work on their SIMMOD engine. The current version is 3.4 — available for both the Windows and Linux platforms. There have been seven requests for the engine since the last release in September 2009. Changes have been forwarded to ATAC Corporation.

The changes are as follows:

- Three enhancements have been made to the dynamic taxiing logic.
 - An aircraft that is taxiing can have its taxi plan re-evaluated (using TAXICHECKPT) to take an alternate path for purposes such as avoiding congestion.
 - Originally (prior to 2008), the logic would only check the occupancy of links of an aircraft's current taxi path.
 - Logic added in 2008 allowed the aircraft to also check departure queues, airspace links, and airspace node occupancies.
 - New enhancement allows the aircraft to check multiple ground links, departure queues, airspace links, and airspace nodes.
 - Whereas all aircraft that roll over a taxi checkpoint node are subject to have their taxi plan re-evaluated, an enhancement has been made to permit aircraft to re-evaluate their taxi path on the basis of whether they meet the following optional filter criteria: aircraft model, aircraft ground group (TAMPS), airline, and/or arrival/departure.
 - Furthermore, any combination of these filters may be specified for a given taxi checkpoint.
- Corrected taxi planning logic was corrected to fix an initialization error caused a very low cost to be assigned to a runway exit link.
- The SIMU10 file has been enhanced to summarize delays and travel times by runway. Also, a fix was implemented to assign flight delays and travel times to the correct runway.
- Column headings were added to the SIMU38 output file.
- Various messages were enhanced to be more informative in cases of errors in the GATEUSE, AIRPORTS, and LINKBLOCKING inputs.
- Departure sequencing logic has been enhanced to allow aircraft a given departure queue to have priority over aircraft at other departure queues either at the same runway or all runways at the airport. This priority can be activated when the number of aircraft in the departure queue exceeds a specified threshold.
- A new entry in the GATE_MDL_PP_TIME inputs allows specific models to be defined for either power-back or push-back for each gate.

- Various coding fixes were made to the logic related to the GATE_MDL_PP_TIME and PPTIME inputs.
- New DYNAMIC_REROUTING inputs have been implemented to allow re-routing due to three conditions: the distance to the leading aircraft, the distance to the trailing aircraft, and the wind direction/speed.
For the latter condition, John indicated that the re-routing would occur if the wind direction or speed of the test link were equal. Various attendees suggested that these be thresholds, so that if the direction or speed exceeds the value, the re-routing would occur.

6. ATAC SIMMOD Status

Eric Boyajian presented the current status of ATAC's SIMMOD-related activities. Version 7.5.4 of Simmod *PLUS!PRO!* was released 18 November 2009. Release of version 7.5.5 is planned for June 2010. The following changes have been made since the last NASUG meeting and will be included in version 7.5.5:

- The Java Runtime Environment has been updated to version 6, update 18. This includes a number of improvements including the anti-aliasing of text and graphics.
- Changes to the Network Builder include:
 - The Plans Builder has been fixed so that it will not crash when updating or deleting plans with no pre-plan time.
 - The copy/paste function of the Procedures Builder did now works properly with Microsoft Excel.
- The Animator now properly uses the `acshapes.txt` file in the `applications\ folder rather than the one in the default folder.`
- `cdf2simu` has been modified to write 0 for missing separation combinations in the STAGGER_SEPARATION table.

Engine changes include the following:

- Random number seeds may now be specified for each iteration of a multiple-iteration simulation by adding them to the RUNDATA file or creating a text file called `random_number_seeds.txt`.
- Gate logic changes:
 - Aircraft in an arrival staging area will now use a newly freed gate if another arrival was assigned to it, even though that arrival had not yet landed. This may cause the subsequent arrival to no longer have an available gate.
 - Departures no longer wait indefinitely for the gate in situations where the occupancy of the gate exceeds the capacity by more than one.
 - The input logic that reads the GATES inputs no longer exhausts memory.
- `TXP_MAX_ALTERNATE` and `TXP_MAX_NODES_FEASIBLE` entries in the GLOBAL_DATA table are no longer used, and the taxi planning logic will attempt to use as many search paths/nodes as the computer's available memory allows.
- Departing aircraft no longer wait an excessive amount of time in the departure queue if a plan change with a pre-plan time goes into effect while the aircraft is taxiing to the departure queue.

7. Planning for the Reconstruction of the Main Runway in Detroit

Belinda Hargrove presented an analysis by TransSolutions LLC to assess the effects of the closure of runway 4R/22L for one construction season. A number of scenarios were modeled with Simmod. The details of this presentation have been withheld from the minutes.

8. San Francisco International Airport Domestic Terminal Alternative Simulations

Eric Boyajian presented work performed by ATAC Corporation for San Francisco International Airport (SFO) to assess the impacts of the proposed alternative terminal redevelopment options using Simmod *PRO!* These involved terminal T1 comprising concourses B and C. The primary goal was to ensure that there were no unforeseen “fatal flaws” and to quantify the taxi times and delays.

A calibration was made using 27 July 2007 as the sample busy day in which conditions were VMC and the prevailing West Plan was in effect. The model was calibrated against various data from sources. Calibration metrics included hourly traffic flows and travel times. The model further included remain-overnight aircraft and complex pushback, taxiing, and departure queuing procedures.

Three primary alternative scenarios were evaluated:

- Finger Pier Single VI
- Finger Pier Dual V
- Modified Linear

No “fatal flaws” were observed in any of the scenarios. All scenarios operate similarly without excessive delays. The airport therefore chose among the scenarios using criteria unrelated to taxi operations.

9. Airport Tour

Mike Hines led a tour of the airport with the assistance of Jitin Sahni. Attendees visited the newly completed mezzanine level of the main terminal and the old air traffic control tower. They then boarded the AirTrain to travel to concourse B and visited the ground movement area tower. These provided excellent views of the airport.

10. Election of New Chair

The group agreed that a new chairperson should be elected, and Tim Swing stood forth for the position. Tim was elected general assent. Eric Boyajian agreed to continue as Secretary.

11. Date and Location of the Next Meeting

The general consensus was that the NASUG should try to resume bi-annual meetings in March and September. 16 September 2010 was selected as the tentative date for the next meeting. The location has yet to be determined.

Eric Boyajian
Secretary, North American SIMMOD Users Group



**List of Attendance at the 25 September 2008 Meeting
of the North American SIMMOD Users Group**

Mr. Eric Boyajian	ATAC Corporation	Secretary
Mr. Arjun Chauhan	University of South Florida	
Mr. Kent Duffy	FAA Airports	
Mr. Makarand Gawade	University of South Florida	
Ms. Belinda Hargrove	TransSolutions LLC	
Ms. Esther Hernandez	FAA – APO	
Mr. Mike Hines	Metropolitan Washington Airports Authority	
Mr. Ashraf Jan	FAA Airports	
Mr. Akira Kondo	FAA – APO	
Ms. Qianlin Li	Landrum & Brown	
Ms. Emily Guerrios	FAA Tech Center	
Mr. Daniel Penrith	FAA Tech Center	
Mr. Nagesh Nayak	University of South Florida	
Mr. Jitin Sahni	Parsons Management Consultants	
Mr. Robert Samis	FAA – APO	
Mr. Fariborz Shahzamani	HNTB Corporation	
Mr. Tim Swing	Ricondo & Associates	
Mr. Erik Wilkins	Ricondo & Associates	
Mr. John Zinna	FAA Tech Center	