



Minutes of the 15 September 2005 Meeting of the North American SIMMOD Users Group

1. Welcome

The meeting convened at 9:00am at the off-airport offices of Baltimore/Washington International Airport (BWI) in Linthicum, Maryland. Dave Holl welcomed everyone to the meeting.

2. Agenda

As Johannes Ehmanns, chairman of the European SIMMOD Users Group (ESUG), was not present, his two presentations (Cologne Airport Masterplan and Airport-Quick-Check) were deferred. The tour of the BWI control tower was moved to 10:45am of 15 September rather than for the following day. Matt Lee and Greg Bradford offered to provide a demonstration of the work by Landrum & Brown and AirportTools on animation enhancement to visualize aircraft vectoring.

3. Minutes of the Previous Meeting

The minutes of the March 2005 NASUG meeting were approved.

4. Review of the Actions from the Previous Meeting

Action: Dave Holl: To update the NASUG website.

Done.

Action: All: To provide a list of studies/airports modeled with SIMMOD to Bob Holladay for inclusion to his articles.

No one has provided this information to Bob, nor had he been able to prepare articles on the usage/benefits of SIMMOD modeling.

Update: Sadly, Bob Holladay passed away on 7 October 2005 and is greatly missed. Dave Holl and Eric Boyajian believe that this action to create articles about SIMMOD in the aviation industry is valuable and should be kept open for action by others in the group.

5. ESUG Activities

Although Johannes Ehmanns was absent, he sent photos of the previous April 25th ESUG meeting in Nice, France, to Dave who shared them with the group. Belinda Hargrove, John Zinna, and Eric Boyajian, who were in attendance at the ESUG meeting, provided commentary for the photo presentation. A significant event at this ESUG meeting was the retirement of Peter Crick, the long-serving ESUG Secretary. This ESUG meeting spanned two full days rather than the usual one and one-half days.

6. FAA SIMMOD Status

John Zinna presented the current status of FAA Tech Center's work on their SIMMOD engine. The current version is 2.5.4 and would be available on their ftp site the week following the NASUG meeting. Five parties have requested their engine since the last NASUG meeting in March 2004. No new bugs have been reported since the last meeting.

The FAA is currently performing a study of Denver. The modeling needs of this study have resulted in new features. All United Airline departures are required to hold for two minutes just prior to departure for a deicing check. The airport has suggested building an apron near a runway end. This apron would have a variable capacity — one heavy or two large aircraft. Likewise, the six deicing areas at Denver have variable capacity — 5-6 large or 2-3 heavy aircraft.

The FAA Tech Center has implemented a new HOLDING_APRON input that specifies a hold time and heavy aircraft capacity multiplier for a given ground node. This hold time may be converted to a time distribution in a future enhancement.

Further, two new restriction parameters based on aircraft model and airline type have been added to the AFLINK (ground link) inputs.

Other enhancements include:

- Arrival spread delay will now be used to update stagger separation.
- Concourse name may now be used in addition to gate names in the gate field of the flight events.

Details on these features can be obtained from John's presentation.

Future work may include allowing the specification of aircraft ground groups rather than just aircraft models in the RUNWAY_EXITS_LINKS and RUNWAY_EXITS_PROHIBITED_LINKS inputs.

The FAA's Modeling Branch SIMMOD study of Denver is ongoing. They are also currently developing inputs for Indianapolis study regarding new large aircraft. A study of the New York area is currently being redefined as the ATO branch is expanding the terminal airspace procedures. This study would examine all of New York Center with its eight major airports and possibly Boston and Dulles.

Bob Holladay mentioned that the FAA is interested in linking SIMMOD with airport terminal models. Belinda noted that the flight times and arrival/departure times used by SIMMOD can be processed for use by terminal models.

7. ATAC SIMMOD Status

Eric Boyajian presented the current status of ATAC's SIMMOD-related activities. ATAC released version 7.1 of ATAC's Simmod *PLUS!* / *PRO!* products in July 2005. A patch to version 7.1.1 is planned for release in September 2005.

Recent work includes fixes to the curved link feature in the user interface and an implementation of database inputs for recently implemented features in the SIMMOD engine.

He then reviewed 14 bug fixes that were made to the ATAC engine since the last NASUG meeting. These are summarized as follows:

- Prior to commencing pushback, aircraft now properly check that no other aircraft was taxiing on blocked links
- Gate selection logic was corrected to allow airline identifiers to contain a number.
- Gate input logic was corrected to read all the staging data properly.
- Gate logic was corrected to eliminate excessive holding in special cases where a flight was blocked from leaving the gate due to an aircraft on a blocking link.
- Departing aircraft now hold at the gate until space is available at the staging area.
- Staging area logic was corrected to choose the correct staging pad for arrival flights that were re-routed.
- The departure procedure HoldUntilRwyClear input parameter has been added so that departing aircraft using different procedures can behave differently.
- The departure procedure InvBlkDur input parameter has been added so that each procedure can specify a different inverse airlink blocking duration.
- The departure procedure PassDelayFlag input parameter has been added so that each procedure can choose whether or not to allow passing in the queue that adds to departure delay.
- Taxi logic was corrected to update the taxipath selection for aircraft reassigned to a different gate at taxicheckpoint or staging pad.
- Landing logic was corrected to properly block the last node of a runway for arrivals that use high-speed exits.
- The default value of the global variable node_sep_ac_choice was changed from 0 to 2.
- Airspace logic was corrected to properly use an aircraft's expected speed upon leaving the node when determining the separation.
- Minor changes were made to improve the forecasting calculations and to ensure that metering vector delay does not exceed the value permitted on a given link.

Recent FAA changes have been incorporated in ATAC's engine. Details on all the changes can be obtained from the presentation.

Ongoing work includes enhancements to the departure queue logic and landing roll logic to add more flexibility in the user inputs. 166 users (including 62 Simmod *PLUS!* customers) from 33 countries have obtained the ATAC SIMMOD engine since the release of version 2.5 in October 2001.

8. Tour of BWI Tower

FAA staff graciously invited the meeting attendees to tour the BWI ATC tower and provided an informative description of BWI operations.

9. Visualizing Vectoring With the AirportTools Visual SIMMOD Animator

Matt Lee and Greg Bradford demonstrated the ability to animate vectored flight paths using the AirportTools Visual SIMMOD Animator. Matt began by discussing the desire to show aircraft following vectored paths (rather than holding at nodes) to provide a more natural-looking display to clients.

There are four primary types of vectoring:

- Trombone
- Deflection path stretching
- Zig-zag path stretching
- Holding pattern

For the trombone and path stretch vectoring, the approach was to define an additional set of nodes and links that represent the maximum deflection possible. The distance along these additional links represents the maximum amount of distance that can be absorbed by vectoring. As a post-processing step, pseudo-nodes are calculated between the “nominal” node and the “maximum deflected” node such that the total distance along the path defined by the pseudo-nodes is equal to the distance flown by the vectored aircraft. The animator then moves the aircraft icons along a curved path defined by the pseudo-nodes.

Holding patterns are defined as a racetrack path having defined length and width and located such that the SIMMOD air node represents the entry/exit point of the racetrack.

An animation of a Landrum & Brown test case model of Cincinnati was shown using the Visual SIMMOD Animator.

10. SIMMOD Applications in Brazil

Renny Apolinário da Silva of the Instituto de Controle do Espaço Aéreo (ICEA) presented an overview of SIMMOD modeling activities in Brazil.

The Brazilian Departamento de Aviação Civil first acquired in SIMMOD 1999 and obtained training from TransSolutions in 2000. The license was then granted to ICEA in order to jointly work with the Instituto Tecnológico de Aeronáutica (ITA) on an academic research basis.

ICEA/ITA and the Instituto de Aviação Civil (ICA) performed a number of studies during 2000–2004:

- Campinas International Airport Airside Capacity Analysis (ICEA/ITA, 2000) to evaluate the resulting bottlenecks due to increase in demand of domestic aircraft and cargo flow
- Brazilian Airport Infrastructure Capacity Study (ICEA/ITA, 2001) to demonstrate a comprehensive study of São Paulo International airport airside operations using simulation
- New Operational Scenarios Analysis of São Paulo/Guarulhos International Airport (ICEA/ITA, 2002) to demonstrate an airside planning methodology based on simulation
- São Paulo Approach Control Area (TMA-SP) Fast-Time Simulation Analysis (ICEA/ITA, 2003) to analyze changes caused by the implementation of STARs in Congonhas, Campinas, and Guarulhos Airports due to a new operational environment in TMA-SP
- Santos Dummont Airport – Rio de Janeiro analyses (ICA) of capacity
- São Paulo International Airport – Congonhas analyses (ICA) of the operational efficiency of parking and runway area systems
- São Paulo International Airport – Congonhas e Guarulhos analyses (ICA) of different proposals of traffic relocation of TMA-SP airports

ICEA participated with MITRE studies related to São Paulo Terminal Area and its main airports using TAAM, but the work was discontinued in 2001 and TAAM was considered to be too costly. They have more recently contributed settings and data related to São Paulo Airport Model to JSIMMOD and plan to resume SIMMOD study work.

11. Next Generation Air Transportation System

Belinda Hargrove provided some highlights of the Next Generation Air Transportation System (NGATS) initiative that is undertaken by the Joint Planning & Development Office (JPDO). The primary assumption of this initiative is that there will be a three-fold increase in air traffic, passengers, and cargo from the present to 2025, and the NGATS initiative will be the mechanism by which the impacts of this increase will be addressed. The JPDO is managed by the FAA and NASA and is organized into a number of Integrated Product Teams (IPTs) each of which is assigned an area of responsibility. These include:

- Airport infrastructure
- Aviation security
- Air traffic management
- Situational awareness
- Environmental protection
- Weather
- Global harmonization
- Safety management

Each IPT has six to twelve positions, some of which are open to outside agency (industry and academia) experts.

Of particular interest to the SIMMOD community are specific operational goals that result from this initiative such as “curb-to-curb” system performance, introduction of new ATM methodologies, and performance-based services.

NGATS funding for FY05 through FY07 is targeted to define overall goals and roadmap for future efforts. The requirements for the FY08 budget are currently under review. In the future, some contracts may be let for studies of NGATS proposals.

The website address is: www.jpdo.aero.

12. Current Activities at BWI

Shawn Ames presented an overview of activities at BWI.

The Maryland Aviation Administration took over ownership of the airport from the city of Baltimore in 1972. During 1982–1993, US Airways used BWI for hubbing operations. In 1993, Southwest Airlines began operating from BWI, and traffic increased substantially. During 2000–2005, there was a transition to less hubbing and more direct city-pair routing which is consistent with Southwest’s operational strategy. During this time a number of changes were implemented:

- Improved vehicle circulation by separating commercial and public traffic zones, expanding express lanes, building skywalks from the parking to the terminals

- Improved parking facilities — 8,400 new spaces, SmartPark technology, and a consolidated rental car area
- Increased terminal capacity — 31 new Southwest Airlines gates
- Increased airside capacity through taxiway modifications
- Enhanced cargo handling at the southwest side of the airport

A capacity study was begun in 1999 but was put on hold in 2001. This study was to look at long-term development issues such as new terminals, new intermodal transportation center, new garages, and people movers to connect all of these. Concourse F expansion to accommodate larger aircraft with 4 new gates is also on hold. However, current annual operations are 305,000 with a forecast of 645,000 annual operations in 2020; so these issues will need to be addressed.

13. Other Business

Greg Bradford was nominated and voted as NASUG Vice Chairman.

14. Date and Location of the Next Meeting

Rob Rau offered to look into the possibility of hosting the next meeting in at Hartsfield-Jackson Atlanta International Airport at a date to be determined.

Update: Matt Davis and Hartsfield-Jackson Atlanta International Airport kindly offered to host the next meeting on 16 March 2006.

Eric Boyajian
Secretary, North American SIMMOD Users Group



**List of Attendance at the 15 September 2005 Meeting
of the North American SIMMOD Users Group**

Mr. Shawn Ames	Baltimore/Washington International Airport	
Mr. Eric Boyajian	ATAC Corporation	Secretary
Mr. Gregory Bradford	AirportTools	Vice Chairman
Mr. Don Guffey	FAA ATO-P	
Mr. David Holl	ATAC Corporation	Chairman
Mr. Robert Holladay	FAA Tech Center	
Ms. Belinda Hargrove	TransSolutions	
Mr. Matt Lee	Landrum & Brown	
Ms. Joy Martin	Ricondo & Associates	
Ms. Kristina Nickles	Ricondo & Associates	
Mr. Rob Rau	Hartsfield-Jackson Atlanta International Airport	
Mr. Renny da Silva	Instituto de Controle Espaço Aéreo, Brasil	
Mr. Adam Turbett	HNTB Corporation	
Mr. John Zinna	FAA Tech Center	