Action Plan 9
System Wide Modeling TIM

November 16-17, 2006

AENA

Madrid, Spain

Action Plan 9 – Points of Contact

- Europe :
  - Manuel Dorado (AENA)
- USA
  - Albert Schwartz (FAA - WJHTC)

Welcome

- Logistics
  - AENA
  - Packets
- Introductions
  - Name
  - Organization
  - What would you like to get from this meeting and what you think you can contribute

Focus

- Identify:
  - the needs, tradeoffs and expectations from a system operations perspective
  - the current and future needs of system wide models
  - existing models and methods for System wide modeling in the scope of ATM/TFM fast-time simulation in Europe and the U.S.
  - future system wide concepts that might be considered for Fast-Time Simulation
  - lessons learned for the utilization of system wide models
  - gaps and shortfalls in system wide modeling

Scope

- “System-wide” is equivalent to runway-to-runway operations (US) or to gate-to-gate operations (European)
- System operations as opposed to economic, financial or the political side of ATM system.
- High-fidelity system-wide modeling capabilities that capture propagation of a problem throughout the system.
- Future operations modeling based on future system (System-wide) reactions.

Elements

- Time Horizon
  - To evaluate system dynamics during a day of operations
  - To assess system capabilities assuming the infrastructure and ideas we have or could implement today. Complex changes in infrastructure will likely require significant changes in modeling capabilities, and will need to be initially investigated using higher level/lower fidelity system-wide models.

Elements cont.

- Flights
  - 4D flight trajectories
  - Aircraft performance characteristics
  - Equipage issues
  - Performance based operations
  - Flight schedule and future demand modeling as an input. We are not investigating a future demand modeling capability.

Elements cont.

- Airports
  - Arrival and departure traffic management
  - Airport surface/ground movements
  - Gate Operations
- Terminal areas
  - Approach and departure trajectories
  - Approach and departure traffic management
  - Corner fixes/important waypoints
  - Terminal Capacity

Elements cont.

EUROCONTROL

– Airspace
  - Regions and domains: ground capability/separations standards and procedures, en-route vs. oceanic, user-preferred routes vs. flex/fixed tracks, etc.
  - Traffic Flow Management (TFM)
  - Dynamic airspace configurations (does not include the logic behind it only the ability to look at different and dynamic sectorization schemes)

Elements cont.

- Environment
  - Infrastructure (impact on operations)
  - Weather
  - Special Use Airspace and Temporary Flight Restrictions
  - Aeronautical information, including LOA, etc.
  - Mixed equipage issues (or performance based operations)
    - Different equipage (technology vs. equipage)
    - Equipped and non-equipped aircraft
  - Current and future operations and procedures
  - Noise and emissions (mostly as a limitation; for instance, a cap on the available resources)
  - Transition to NextGen

Elements cont.

- Decision Making
  - Air-carriers/AOC's (as applicable to flight efficiency and recovery, but not planning or scheduling)
  - ANSP's
  - Other ATC related positions (TFM, MSP, etc.) (ATM related)
  - Pilots
  - Information exchange (data requirements, etc.)
  - Inter-operability issues (performance of different tools that work on the same issue; data availability: accuracy, timelines, etc.)

Elements cont.

- Human Involvement
  - Task-load: what exactly is done
  - Workload: can it be done
  - Pilot vs. controller: roles and responsibilities, integration issues, resolving the off-nominal conditions, failure mode, etc.
  - Automation vs. human: roles and responsibilities, integration issues, resolving the off-nominal conditions, failure mode, etc.
- Performance assessment
  - Metrics
  - Measures
  - Connectivity to Flight Plan and similar docs

Elements cont.

- Other issues
  - Interoperability between models
    - Is there a model that does it all, or
    - Do inputs/outputs of various models assure ability to sequentially run a scenario through several models in order to get the whole picture
  - Is it possible to model some real-world challenges faced by the ANSP's that impact the ability to achieve the same success as achieved within a simulation
    - Differences in behavior between different air-carriers; for instance, some are willing to fly closer to a bad weather cell then the others
    - Unforeseen effects of initiatives in the real-world; for instance, limitation of the ground delay programs by focusing only on the large airports (Chicago vs. Midway)

Format

- Day 1 and 2
  - 11 Presentations
    - approximately 20-30 minutes
    - 15 minutes of questions/comments to follow
- End of Day 2
  - Open discussion of objectives and conclusions

Products

- Paper identifying the current and future state of System Wide Modeling

Thursday 16 / 11 (day 1)			
08:30	Welcome at Hotel Velada Lobby		
09:00	Welcome with introductions	Manuel Dorado and Albert Schwartz	AENA/FAA
09:30	Objectives	Albert Schwartz and Manuel Dorado	FAA / AENA
10:00	Presentation 1 –System Wide Modeling Requirements from the HQ point of view	Joe Post	FAA
10:45	Break		
11:05	Presentation 2 – SAAM	Thierry Champougny	Eurocontrol HQ
11:50	Presentation 3 – System Wide Modeling for the JPDO	Shahab Hasan	LMI
12:35	Lunch		
14:00	Presentation 4 – System Wide FTS Architecture	Ian Crook	ISA software
14:45	Presentation 5 –System Wide Modeler	Pete Kuzminski	MITRE
15:30	Break		
15:50	Presentation 6 – FTS and Macromodel loop	Manuel Dorado	AENA
16:35	Day 1 wrap-up discussion		
17.00	Meeting closes		

Friday 17 / 11 (day 2)			
09.00	Presentation 7 – FAP Model	Marc Dalichampt	Eurocontrol EEC
09:45	Presentation 8 –System Wide Modeling with ACES	Bob Windhorst	NASA Ames
10:35	Break		
10:50	Presentation 9 – CDM Process Simulator	Victor Bustos	INECO
11:35	Presentation 10 – Human Performance in System Wide Modeling	Kevin Corker	SJSU
12:20	Lunch		
13:50	Presentation 11 – WITI and System Operations Perspective	Diana Liang	FAA
14:35	Break		
15:00	Day 2 wrap-up and final discussion/conclusions		
16:00	Meeting closes		