



Leader/Follower Static Pairwise (RECAT Phase II)

RECATEGORY
WORKSHOP
June 20, 2011

Recategorization is a Three Phase Effort

- Phase I is Static 6 Category Separation
- Phase II is static pair-wise separation
 - Initial Considerations to be Presented in this Meeting
- Phase III is dynamic pair-wise separation
- All three phases are required steps towards NextGen and SESAR

EUROCONTROL/FAA Cooperation

- Phase I
 - Joint effort led by FAA and EUROCONTROL
 - Memorandum of Cooperation (one of 20+ Coordinated Action Plans)
 - Action Plan 14 deals with Wake Turbulence
- Phase II
 - Not well suited for SESAR JU
 - Implementation targeted for 2015
 - Currently US cannot participate as partner
 - Better suited for AP14

Phase II Improvements Over Phase I

- Phase I

- Optimized 6 static categories for a fleet mix averaged over 5 US and 4 European airports
- Used $\frac{1}{2}$ NM increments
- Capacity gain shown for constrained airports now and 15 years from now

- Lessons learned from Phase I effort

- Recommended 6 category static system not optimized for any one airport
- The efficiency gained from any optimized static categorical system will suffer as fleet mix changes over time

- Phase II

- Will provide pairwise separation minima that is independent of fleet mix, therefore it
 - Can be optimized for any airport
 - Will sustain effectiveness as fleet mixes change
- May provide separation minima to less than $\frac{1}{2}$ NM

Phase II Will Retain Some of the Best Characteristics of Phase I

- Not a Big Bang Implementation
- Phase II, Phase I and Today's ICAO categories are safe
- All three systems can co-exist
- Performance Based Transition
 - Each ANSP can transition to RECAT when needed
 - Transition Decision by one ANSP has No Impact on Adjacent ANSP
- No Required Changes to ICAO Flight Plan

Requirements and Scope of the Effort

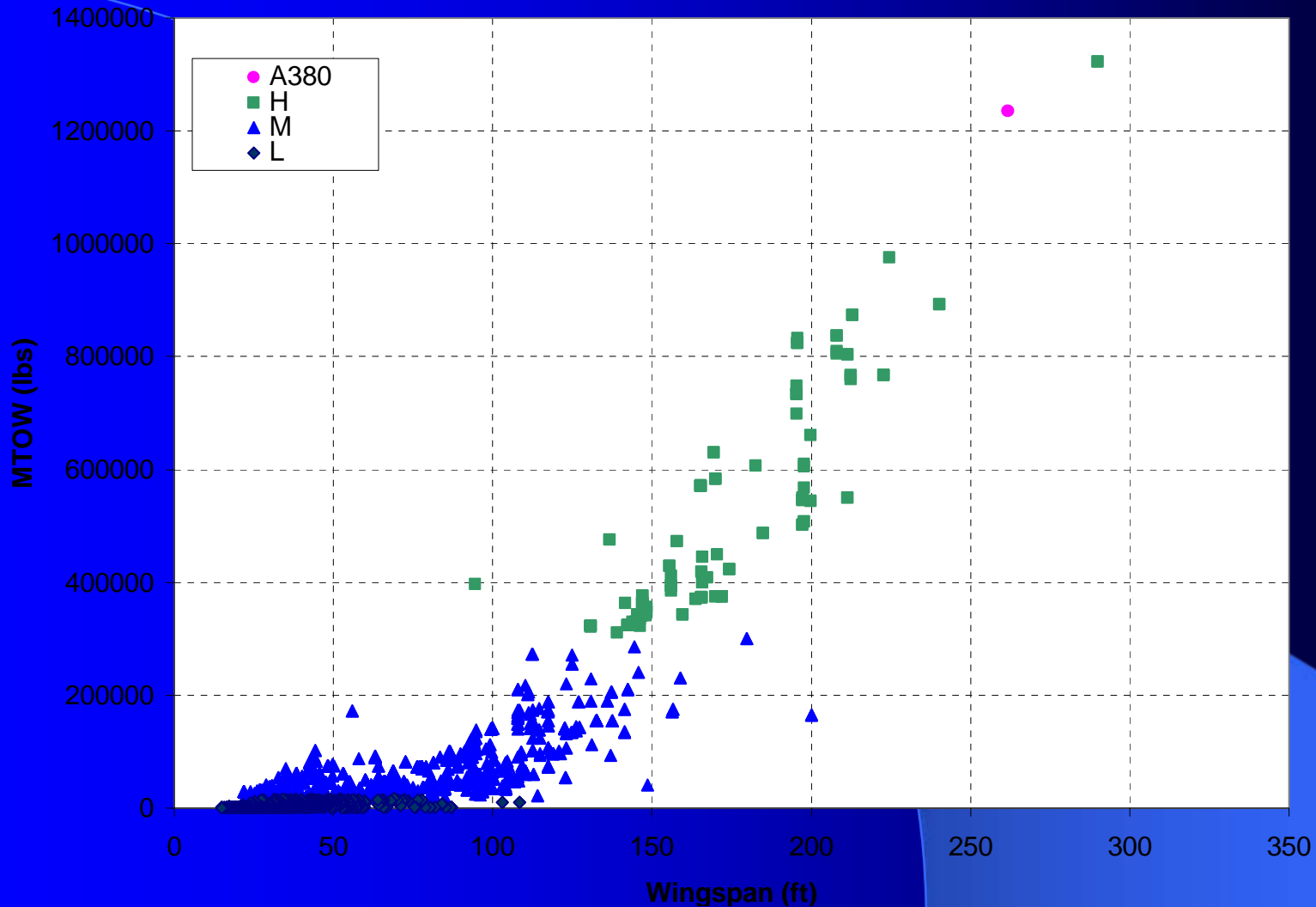
- Safety: As safe or safer than today
- Transparency: Openly available tools and data
- Fleet mix drawn from capacity constrained airports around the world
- Additional aircraft performance data will be used if made available by manufacturers
- Methods and Metrics drawn from Phase I effort as well as new recommendations from stakeholders
- Recommendations will apply to Arrivals, Departures and En-Route
- Increase capacity

Phase II Concept of Operations Considerations

- RECAT, DECAT or Both?
- ICAO DOC 8643
 - 9000+ aircraft identifiers
 - 1200+ unique aircraft types
- 1, 440,000+ static pairs
- So how complex is this problem?

Vast Majority of Aircraft Types are ICAO Light

MTOW vs b



Vast Majority of Aircraft Types are Phase I Category F

Phase I Category	Wingspan Range	Total Aircraft Types*
A	> 245	4
B	>175 and \leq 245	45
C	> 125 and \leq 175	132
D	> 90 and \leq 125	541
E	> 65 and \leq 90	632
F	\leq 65	7714

RECAT Separation Matrix is Much More Sparse Than Separation Table Indicates

RECAT Separation Matrix

		Follower					
		A	B	C	D	E	F
Leader	A		5.0	6.0	7.0	7.0	8.0
	B		3.0	4.0	5.0	5.0	7.0
	C				3.5	3.5	6.0
	D						5.0
	E						4.0
	F						

How Complex Does Phase II Separation Matrix Need to Be?

- Remember that 61 aircraft made up 85% of operations at 4 European and 5 US airports
- EGLL Example
 - 1300 operations in one day
 - 25 aircraft types comprised all but a few of those operations
- Similar Experience at Other Capacity Constrained Airports
- For a given airport, a 30 x 30 matrix will enable ~100% of the efficiency available from Phase II

Example Airport

- Let's say 25 aircraft make up 99% of operations
- A 1200 x 1200 matrix covers all pairwise combinations
- Automation required to provide required separation to ATC
- Practical considerations could affect ANSP implement at the example airport
 - 25 x 25 Matrix covers 99% of operations and applies exact separation minima for almost all operations
 - Smaller separation matrices are possible without much sacrifice to efficiency
 - A 10 x 10 matrix would contain 2-3 aircraft per category
 - A 6 x 6 matrix would contain 4-5 aircraft per category
 - Manual lookup of Phase I RECAT 6 x 6 matrix covers all other operations

ANSP Choices

- DECAT
 - Full 1200 x 1200 matrix with automation
- RECAT
 - A 10 x 10 optimized matrix covering most pairs
 - Phase I RECAT 6 x 6 covering all other pairs
- Both
 - A 25 x 25 matrix covering ~99% of operations
 - Phase I RECAT 6 x 6 covering all other pairs
- ANSP can choose one option for one airport and a different option for another airport in its domain
- Any ANSP decision (choice and implementation timing) is independent of any other ANSP decision

Next Phases

