

Collaborative Arrival Regulation Avoidance – CARA

from in-vivo experiment to ATM procedure

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SAFETY IS IN THE AIR



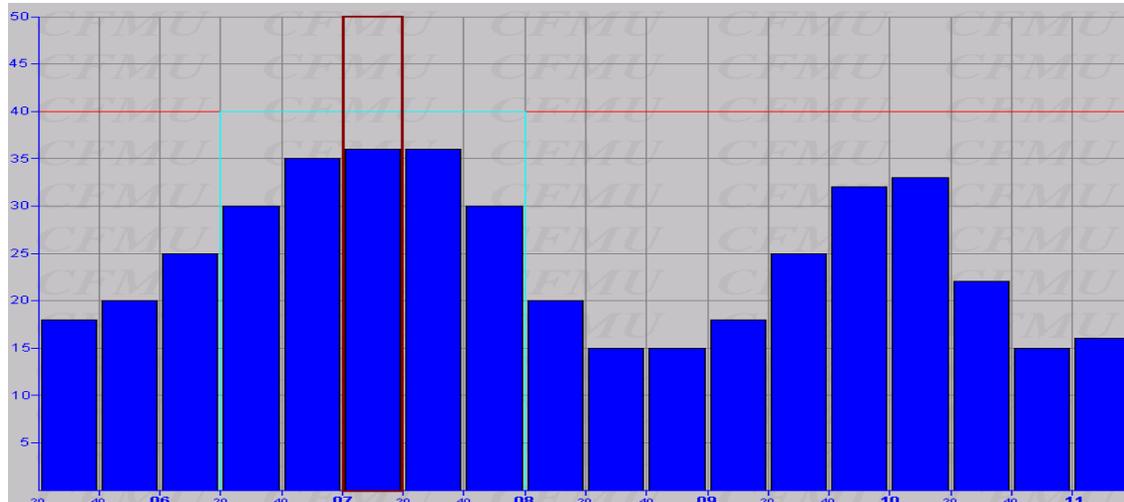
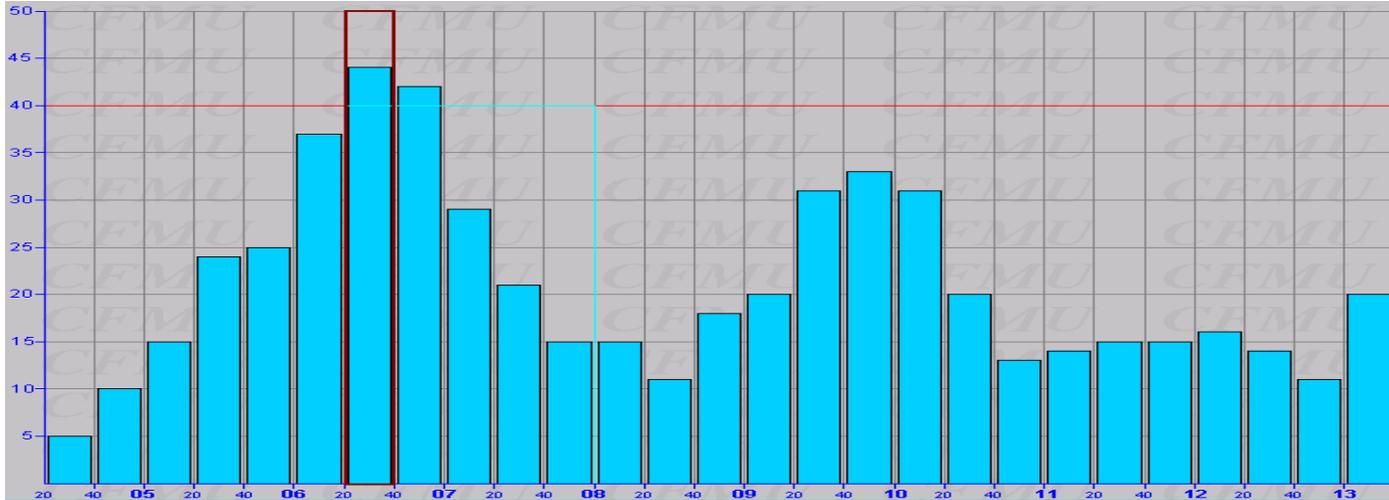
The Problem

- ▶ arrival delay in Vienna had become a structural problem
- ▶ main reason was a mismatch between airport and ATC capacity
- ▶ specifically problematic for hub-and-spoke operations of home carrier
- ▶ bad ranking of Vienna Airport in delay statistics despite high ATM performance
- ▶ ATFM regulations regarded as the only remedy

The Observation

- ▶ traffic demand is initially more “peaked” than it is eventually delivered to Vienna APP – “natural spread”
- ▶ regulation of short peaks seems to miss the purpose as the forced traffic spread leads to longer periods of high workload
- ▶ oftentimes, the forced traffic spread of ATFM regulations leads to capacity waste in short peaks
- ▶ ATFM delays have historically been developed as a standard remedy for capacity shortage
- ▶ yet, ATFM delays are not always adequate and certainly have a high cost

Short Peak Regulations – waste of capacity?



Predicted demand versus actual load following a regulation (40/60)

The Idea

- ▶ how about trying a “hands off method” where the natural spread solves the problem (most of the times)?
- ▶ this obviously requires a safety net in case of overload
- ▶ idea had been brought up many years before, but the only safety net envisioned then were additional ACC holdings
- ▶ ACC holdings seemed to high a price for a safety net (staffing, airspace structure, etc.)
- ▶ new idea came up during a Eurocontrol task force meeting:

“LOCAL CHERRY PICKING”

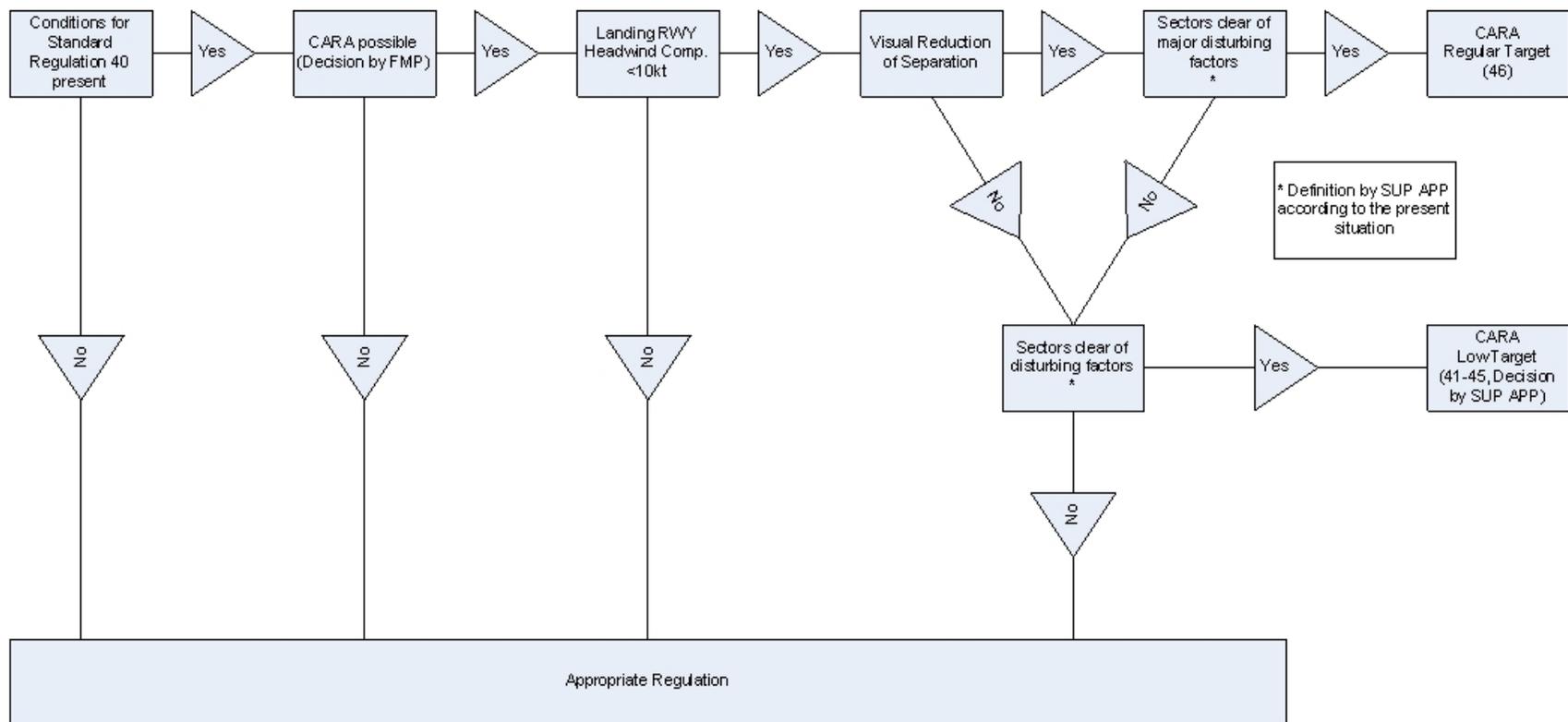


The Procedure

- ▶ under certain circumstances (no WX or staff issues), no regulation will be applied, even if the initial demand exceeds the capacity limit of 40 arr/h
- ▶ reliance on “natural spread” and advantage of short-peak rather than prolonged workload
- ▶ if trigger value of (currently) 46 arr/h is exceeded, the excess demand has to be “manually” regulated back to 46 or below with “local cherries”
- ▶ “cherries” are short-haul inbound flights that arrive in the critical time window and can be taken out of the critical window by “manual” delay of up to 15min

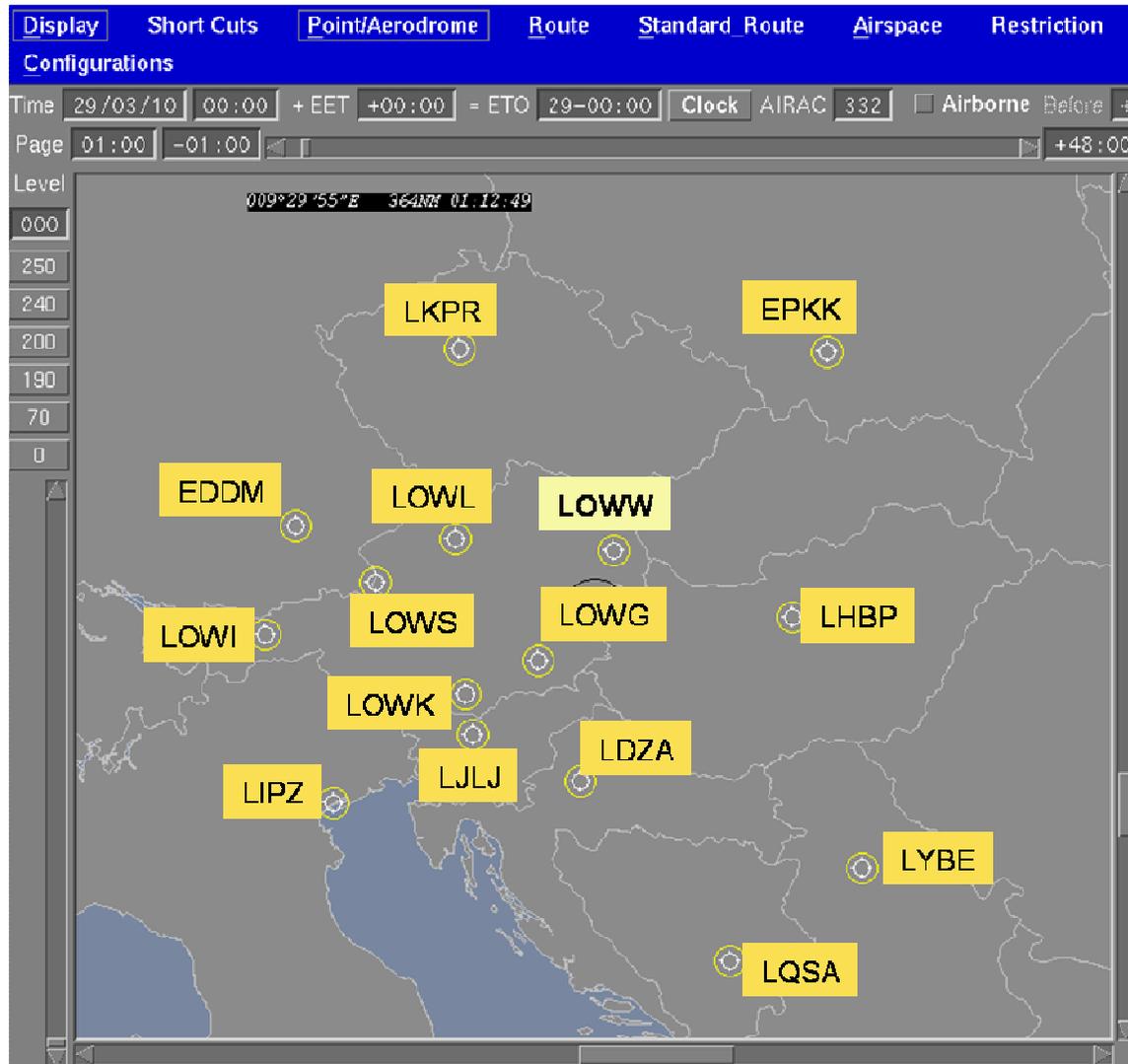
The Procedure (cont'd)

CARA Decision Process



SUP APP has the final decision about the used regulation and may for any reason deviate from the procedure above!

The Procedure (cont'd)



Airports of Origin used for Local Cherry Picking in Vienna (LOWW)

The Trial

- ▶ trial was performed for 2 weeks in fall 2010
- ▶ trial set-up done with direct involvement of ATCOs
- ▶ flow management (FMP) role was quickly trained
- ▶ general feedback from the OPS room was good
- ▶ delay reduction was impressive!
- ▶ decision taken to implement CARA as standard procedure in Vienna

The Solution



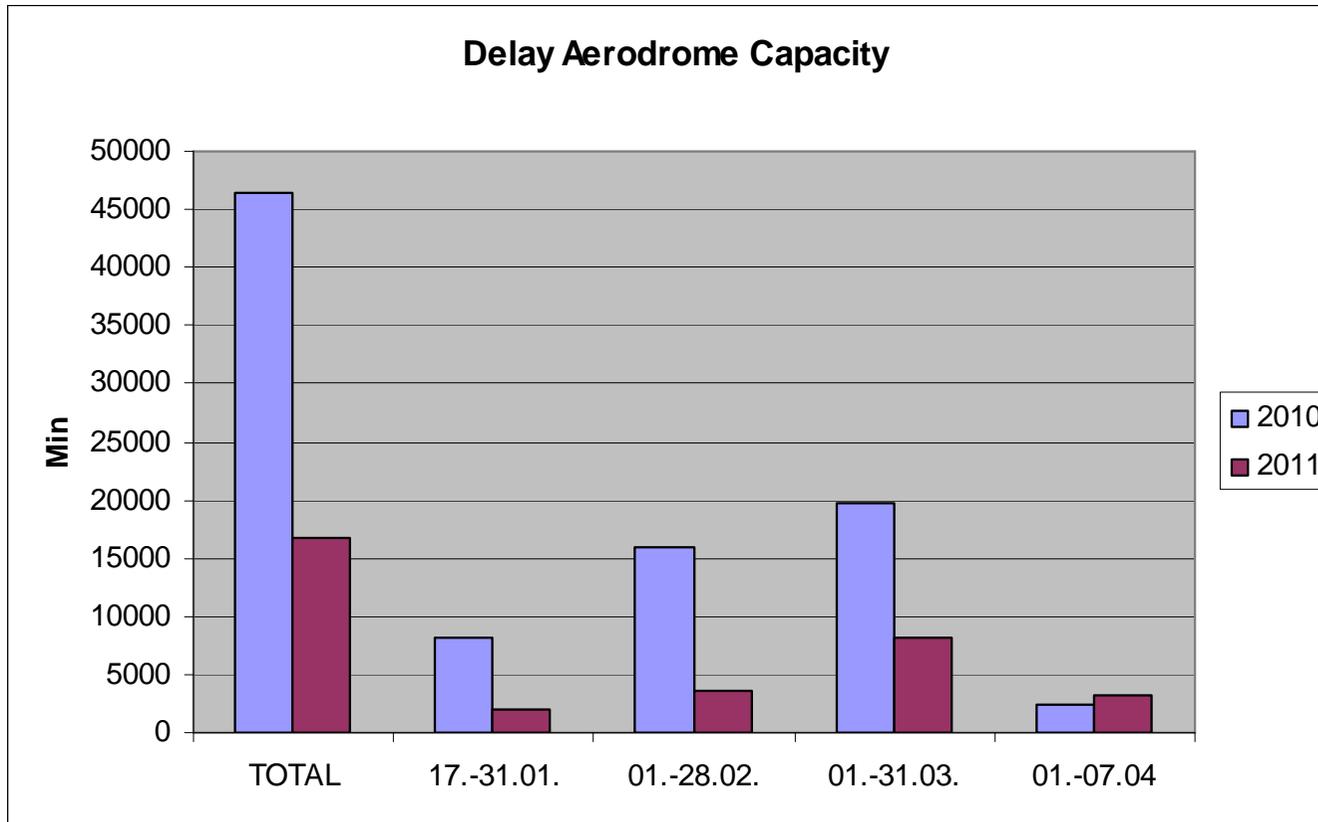
- ▶ implementation was easy after successful trial run.
- ▶ several training sessions were performed for APP supervisors and FMP personnel
- ▶ information sessions were held for APP controllers
- ▶ monitoring agreements with airlines were made
- ▶ procedure shows (and exceeds) predicted success



Problems Encountered

- ▶ the question of equity (hub carrier vs. other airlines on “cherry” routes)
- ▶ general concept: the more you benefit as an AO, the more you have to sacrifice
- ▶ initial lack of understanding amongst some supervisors lead to wrong decisions about CARA application
- ▶ good information policy is vital!
- ▶ one FMP unit outside Austrian FIR refused further collaboration due to procedural problems, BUT all others happily cooperate!

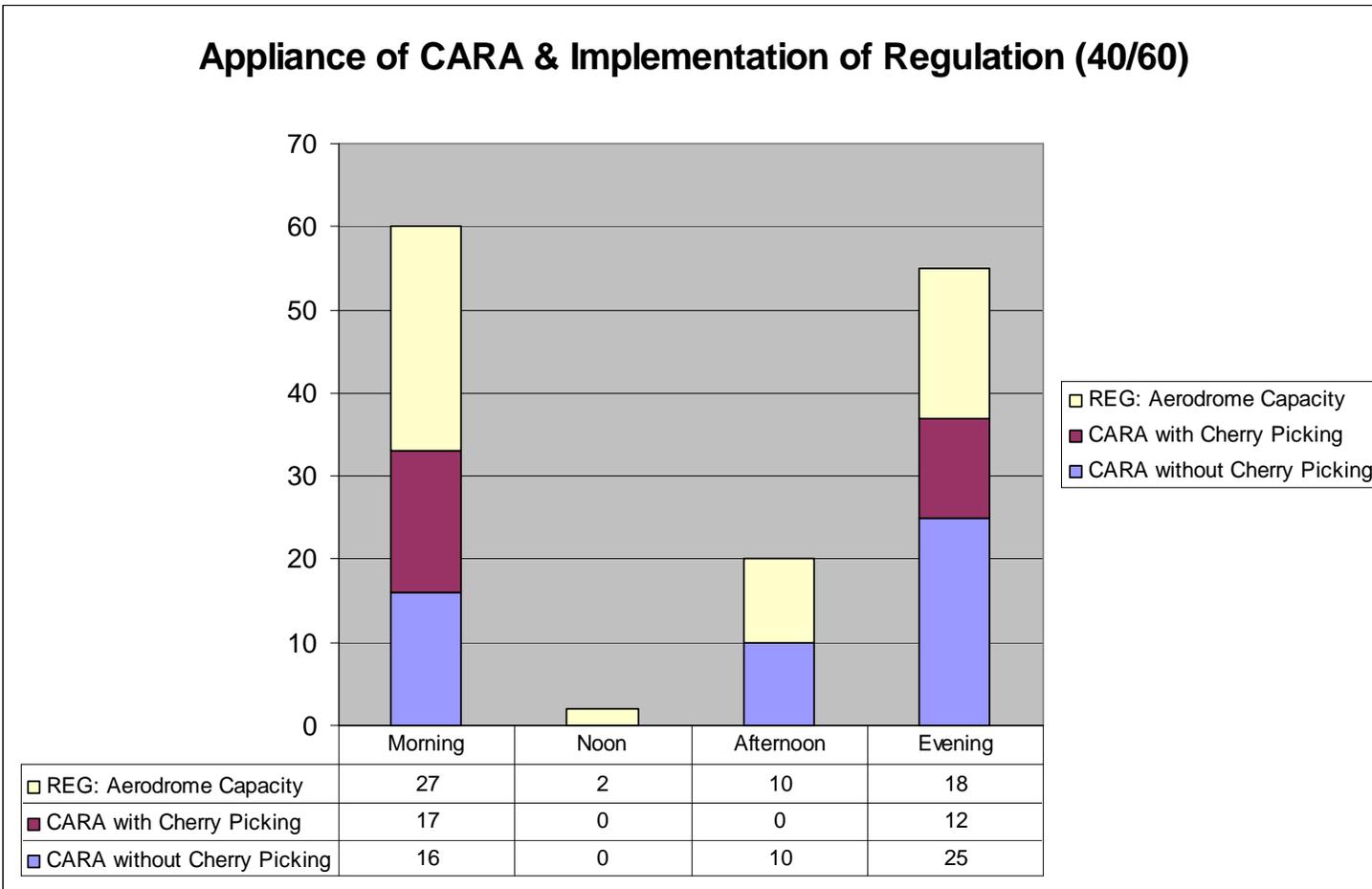
Results Achieved



	TOTAL	17.-31.01.	01.-28.02.	01.-31.03.	01.-07.04.
2010	46324	8232	15950	19717	2425
2011	16767	1932	3577	8097	3161

Results Achieved (cont'd)

Appliance of CARA & Implementation of Regulation (40/60)



Results Achieved (cont'd)

TMA entry time adherence of cherry-picked flights

Categories:

▶ **OK:**

- non-adherence up to plus/minus 2 minutes
- including following exceptions:
 - x minutes earlier when shifted forward
 - x minutes later when shifted back

▶ **Up to 5 min:**

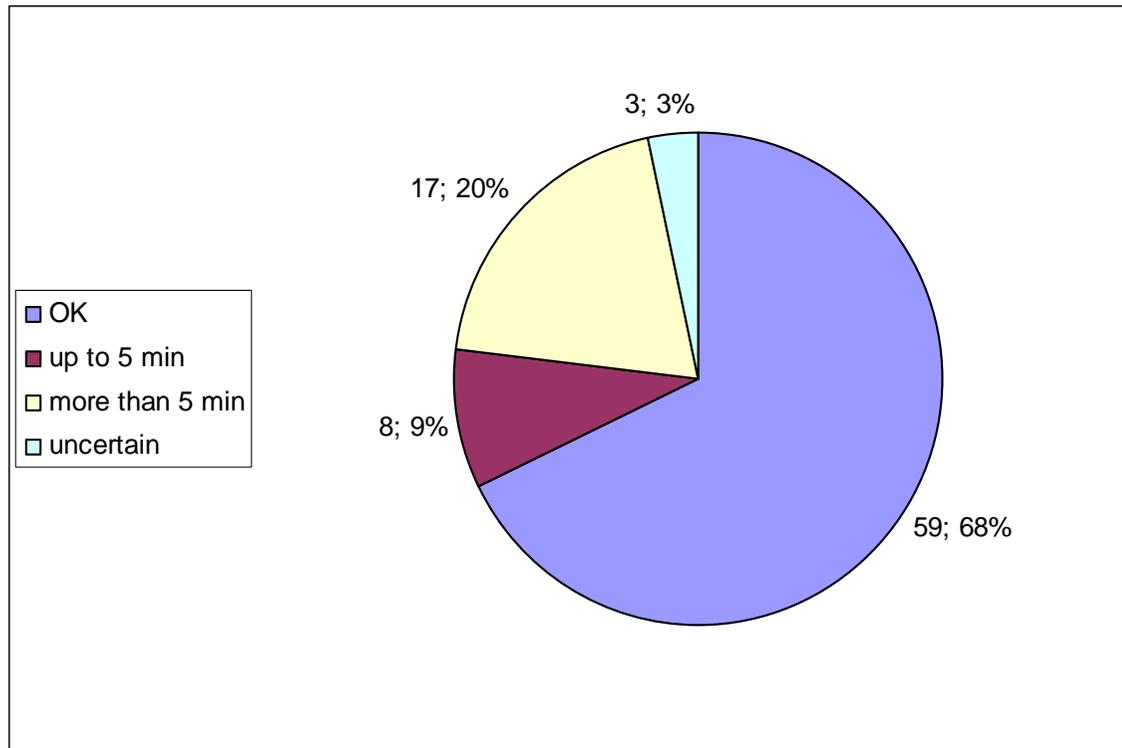
- non-adherence 3 to 5 minutes

▶ **More than 5 min:**

- non-adherence more than 5 minutes

▶ **Uncertain:**

- Actual ETO over entry point unknown, as the flight received a direct routing.



Model for Others?

- ▶ structurally, many airports in Europe face similar capacity problems
- ▶ several FMP units have expressed interest
- ▶ does such a local solution – despite its benefits for the network - undermine the Eurocontrol CFMU concept if more airports follow?
- ▶ is there a critical mass where CARA counteracts the Central Flow Management approach?
- ▶ can the issue of equity be balanced in a more complex situation of multiple hub carriers at an airport?

The Way Ahead

- ▶ CARA is implemented as a standard procedure
- ▶ constant monitoring with minor adjustments is performed in close cooperation with the airlines involved
- ▶ major re-assessment workshop after half a year coming up
- ▶ CARA is a good medicine, but the disease is still there (capacity mismatch)
- ▶ existence of a new safety-net method (local cherry picking) might be helpful for other projects to come

Thank you very much!

ask your questions...
...without delay ;-)