

# Cross Polar Route Trial Results

Presented to: CPWG/5 Dallas-Fort Worth TX

By: Mike Brennan

Date: April 1-3, 2008



Federal Aviation  
Administration



# Brief History

- **March 2006 CPWG Meeting**
  - Problem: Flights were not making the assigned GRL departure window
  - Needed to improve GRL compliance rate and enhance overall capacity
- **ATCSCC and NOC were introduced to the GRL process May 2006**
  - Monitor departure compliance
  - Observe traffic flow from a national perspective
  - Take corrective action to assist with separation



# Problem

## LISKI Flights May 18, 2006

C/S	GRL	ATD	FIX Xing	Req Atl
AAL167	1600	1558	2250	116
UAL877	1800	MOVED TO TRACK R		
AAL153	1800	1820	0033	116
JAL5	1755 CTD	1748	0036	096
KAL094	1801	1807	0050	106
KAL082	1810	1803	0057	096
KAL038	1823	1847	0110	106
KAL036	1738	1757	0130	106
ACA001	1929	1923	0150	106
NWA71	1929	2017	0235	106

- Data received via email from ZAN TMU

# Solution

- **Assign Controlled Departure Times**
  - CDTs assigned to flights en route to Polar fixes
  - CDTs passed to Center TMUs by ATCSCC
  - TMUs entered into HOST computer
  - Towers received and issued assigned CDTs
- **Problem solved**
  - Departure compliance improved dramatically



# New Problems

- **Complaints Increased**
  - Airlines needed more flexibility
  - Problems staging the aircraft to meet GRL departure times
    - Required long runway for departure
    - Time required for de-icing
  - Inconsistent application of GRL data by ATC
  - Overly restricted Polar fix capacity

# Additional Limitations

- **DOTS+ GRL Limitations**
  - Constantly changing
  - Does not always reflect the crew's intentions
  - May not reflect the dispatcher's intentions
  - GRL loading included buffer
- **ATC Limitations**
  - Lack of direct communication
  - Outside radar surveillance
- **Aircraft Limitations**
  - Weight and performance

# November 2006 – October 2007

## Polar Route Demand

•Data collected from the 1430 GRL prior to track loading

FIX	TOTAL	AVG	15 MINS/ALT	PEAK DAY
<b>DEVID</b>	<b>362</b>	<b>.99</b>	<b>.04</b>	<b>6 A/C 3-tms</b>
<b>RAMEL</b>	<b>1849</b>	<b>5.08</b>	<b>.36</b>	<b>12 A/C 3-tms</b>
<b>*NIKIN</b>	<b>111</b>	<b>.30</b>	<b>.01</b>	<b>7 A/C 1-tms</b>
<b>ORVIT</b>	<b>1064</b>	<b>2.92</b>	<b>.26</b>	<b>12 A/C 3-tms</b>

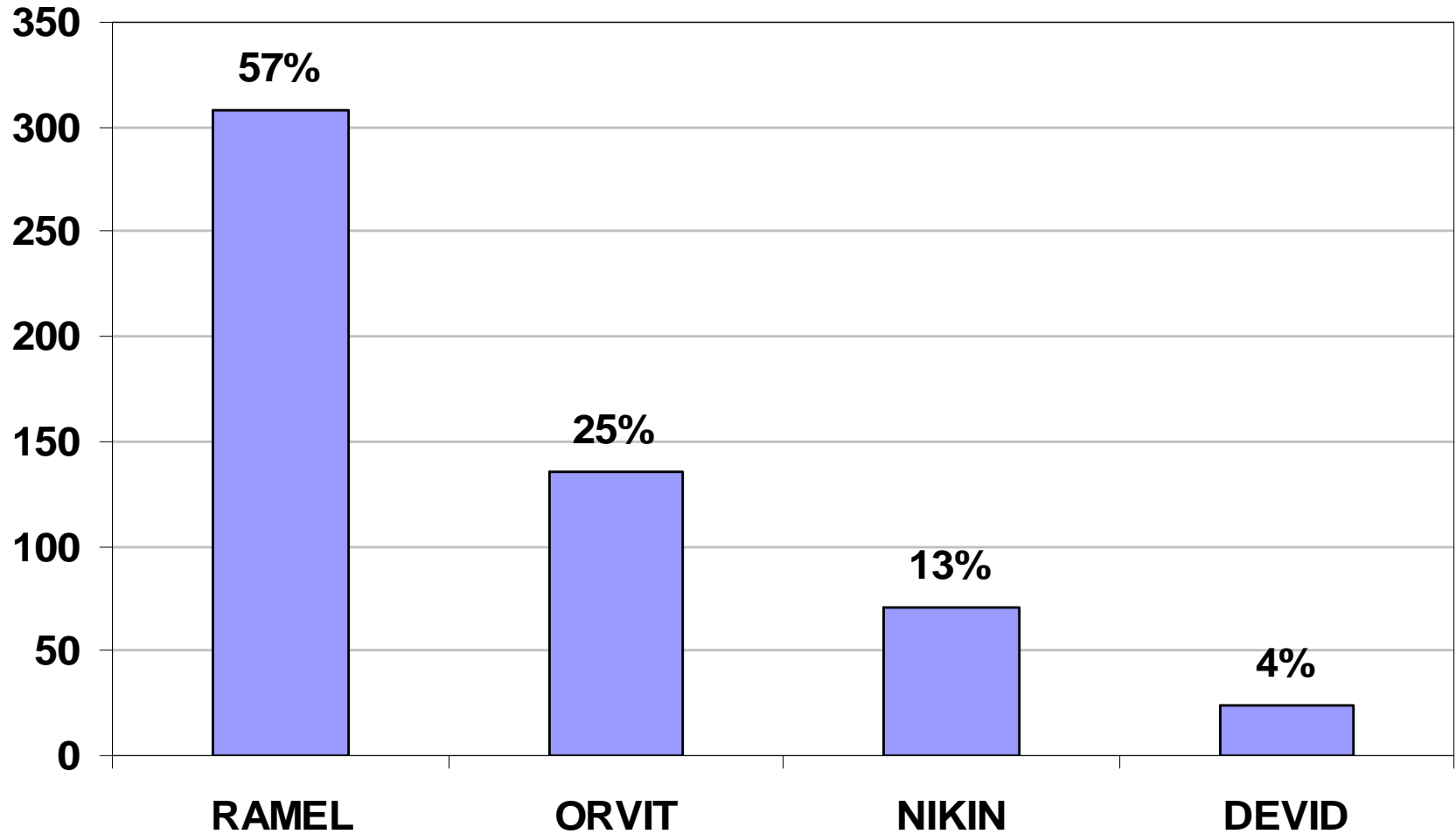
•\*NIKIN WAS ADDED IN JULY 07

# Polar Route Test Timeline

- **Jan 14, 2008**
  - CDTs no longer sent, GRL 10 minute buffer continued
- **Feb 11, 2008**
  - GRL buffer reduced from 10 to 5 minutes
- **Feb 29, 2008**
  - GRL buffer eliminated – all flights loaded using 10 minutes minimum separation



## Number of Flights by Fix, January 14 - February 29, 2008



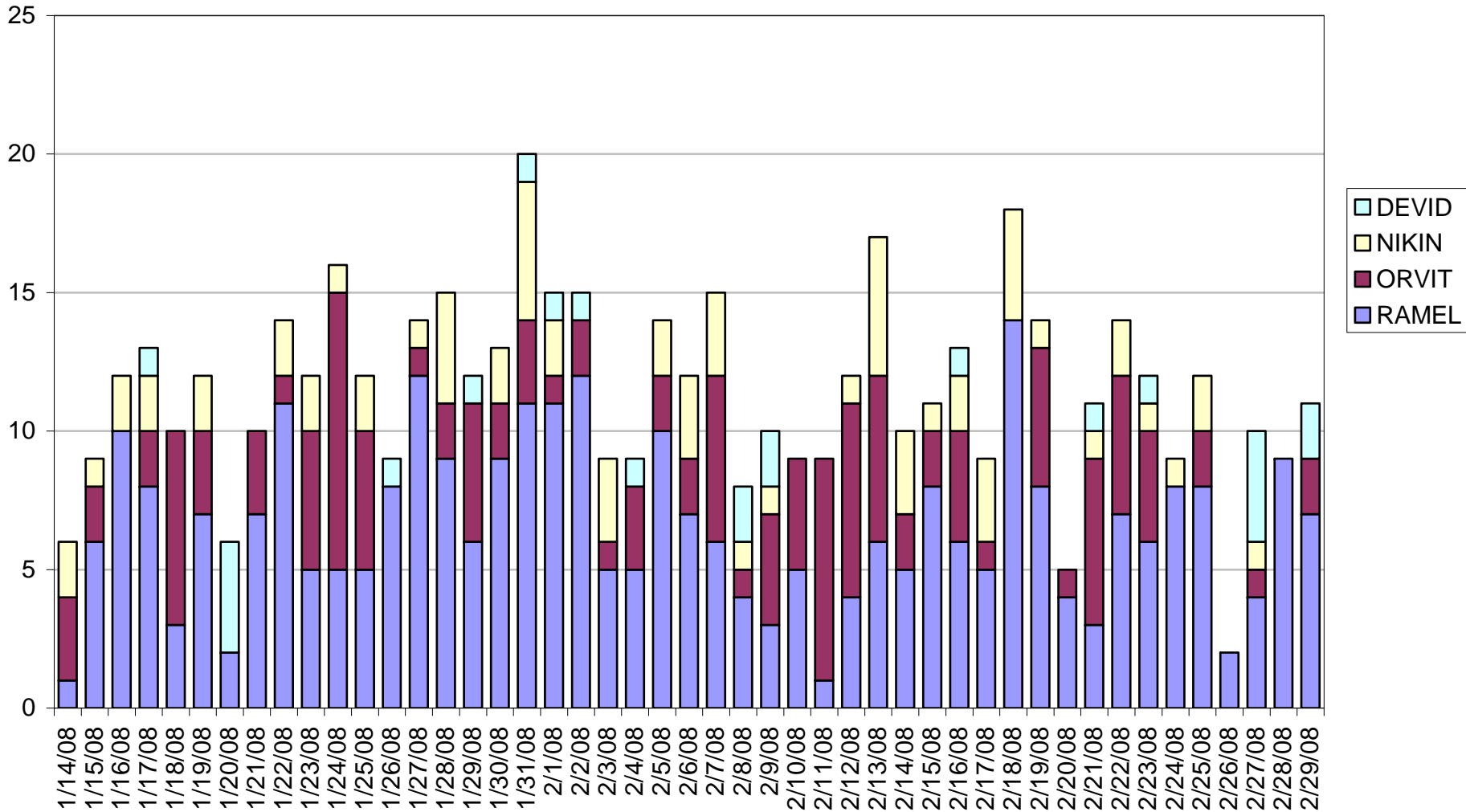
# DEVID/RAMEL/NIKIN/ORVIT Demand

Flights that hit assigned departure window	150 flights	30.2%
Flights assigned a delay	33 flights	6.6%
Flights that got their 1430 GRL requested altitude	384 flights	77.3%
Flights that did not get GRL requested altitude with no apparent traffic	84 flights	16.9%
Flights that did not get GRL requested altitude due to traffic	31 flights	6.2%
Flights that got pilot/dispatch request or GRL requested altitude	468 flights	94.2%

# Test Demand over RAMEL

<b>Flights that hit assigned departure window</b>	<b>87 flights</b>	<b>29.1%</b>
<b>Flights over RAMEL assigned a delay</b>	<b>24 flights</b>	<b>8.1%</b>
<b>Flights that hit assigned delay window</b>	<b>4 flights</b>	<b>16.6%</b>
<b>Number of days aircraft were assigned delays</b>	<b>14 out of 47 days</b>	
<b>Maximum assigned delay</b>	<b>23 minutes</b>	
<b>Average assigned delay</b>	<b>6.2 minutes</b>	
<b>Flights that got their 1430 GRL altitude</b>	<b>234 flights</b>	<b>78.5%</b>
<b>Flights that did not get alt with no apparent traffic</b>	<b>44 flights</b>	<b>14.7%</b>
<b>Flights that did not get GRL alt due to traffic</b>	<b>20 flights</b>	<b>6.7%</b>
<b>Flights that got pilot requested or GRL altitude</b>	<b>278 flights</b>	<b>93.2%</b>

### Number of Flights by Day and Fix



# Peak Fix/Day/Volume during Test

## DEVID

- Jan 20 & Feb 27      4 aircraft

## RAMEL

- \*Feb 18, 2008      14 aircraft

## NIKIN

- Jan 31 & Feb 13      5 aircraft

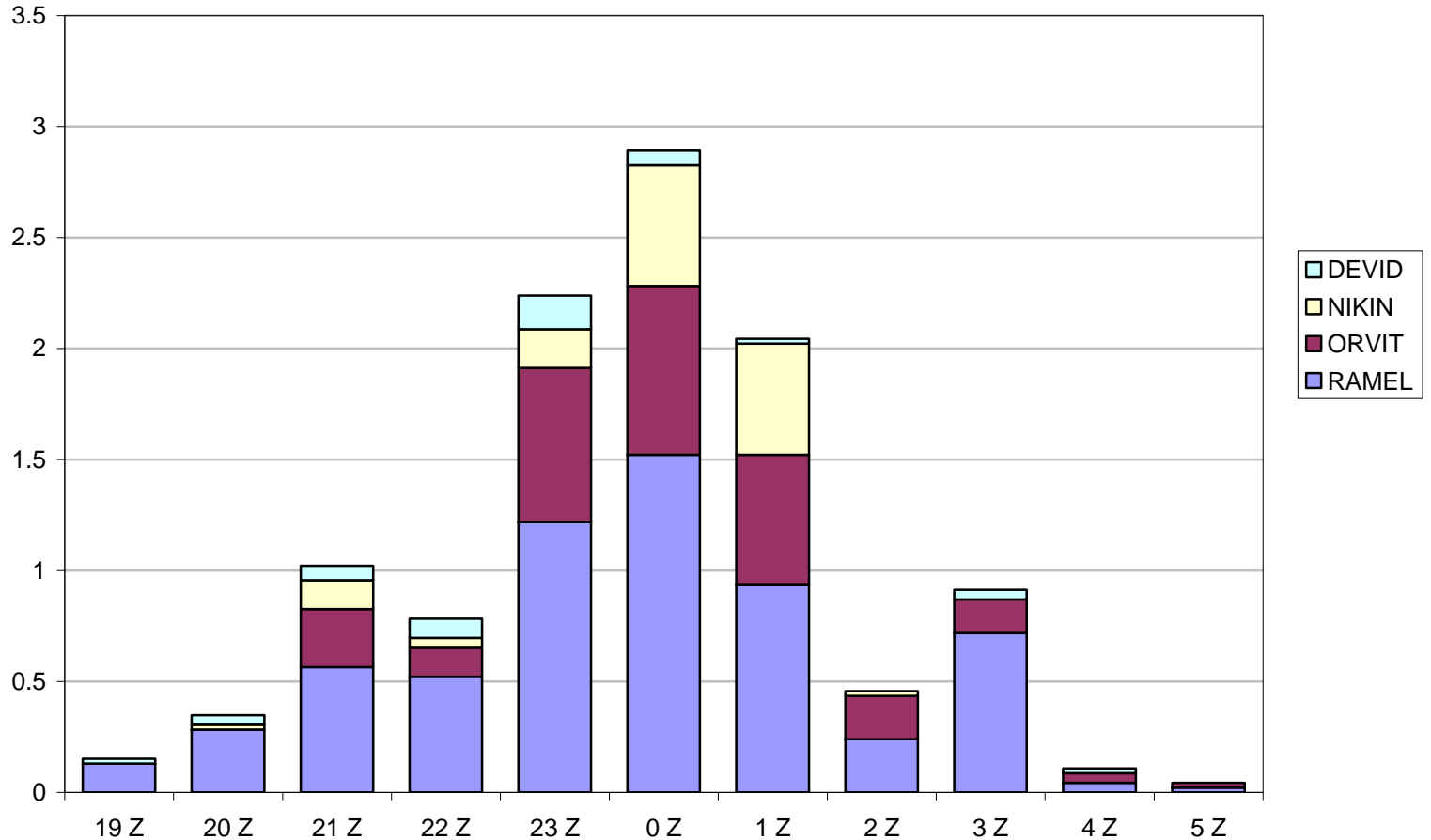
## ORVIT

- Jan 24      9 aircraft

\*Highest day observed for any Polar fix since Oct 2006

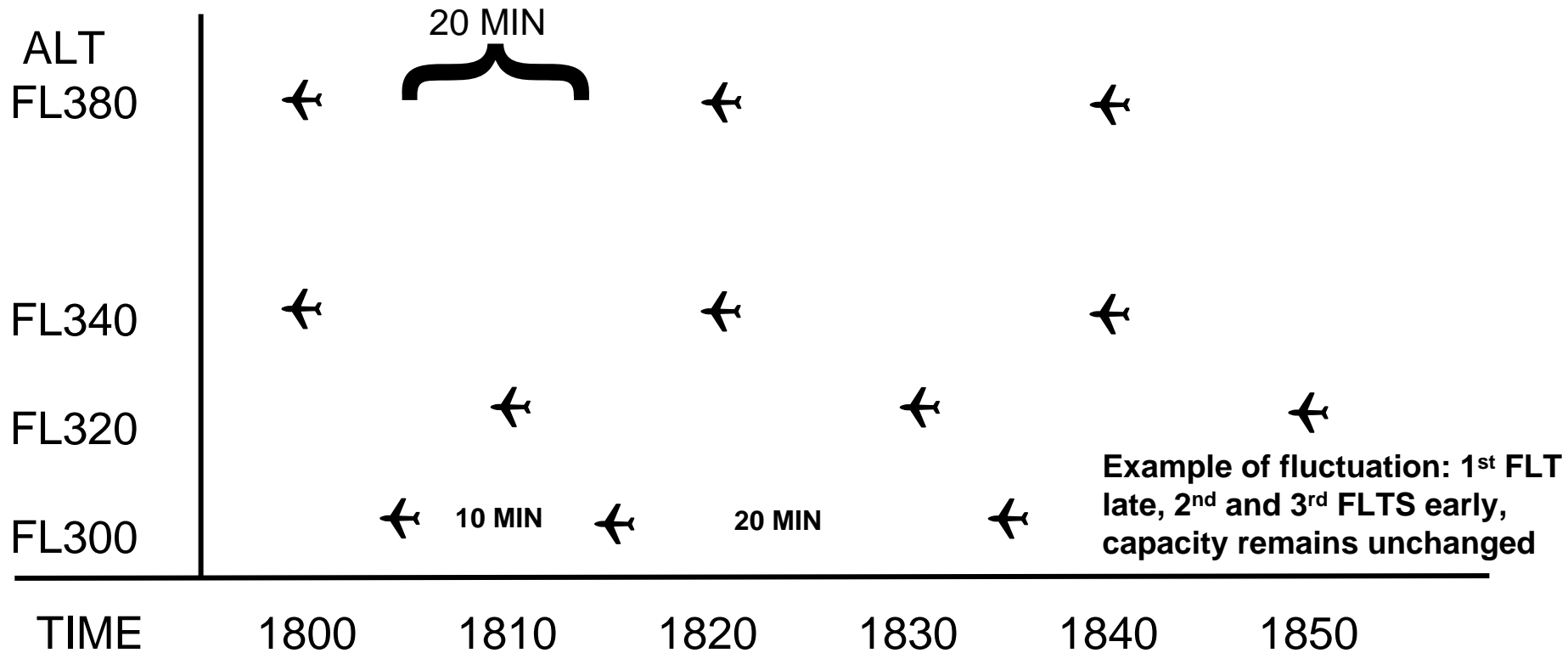
January 14 - February 29, 2008

Average Number of Arrivals (Actual) by Fix and Hour



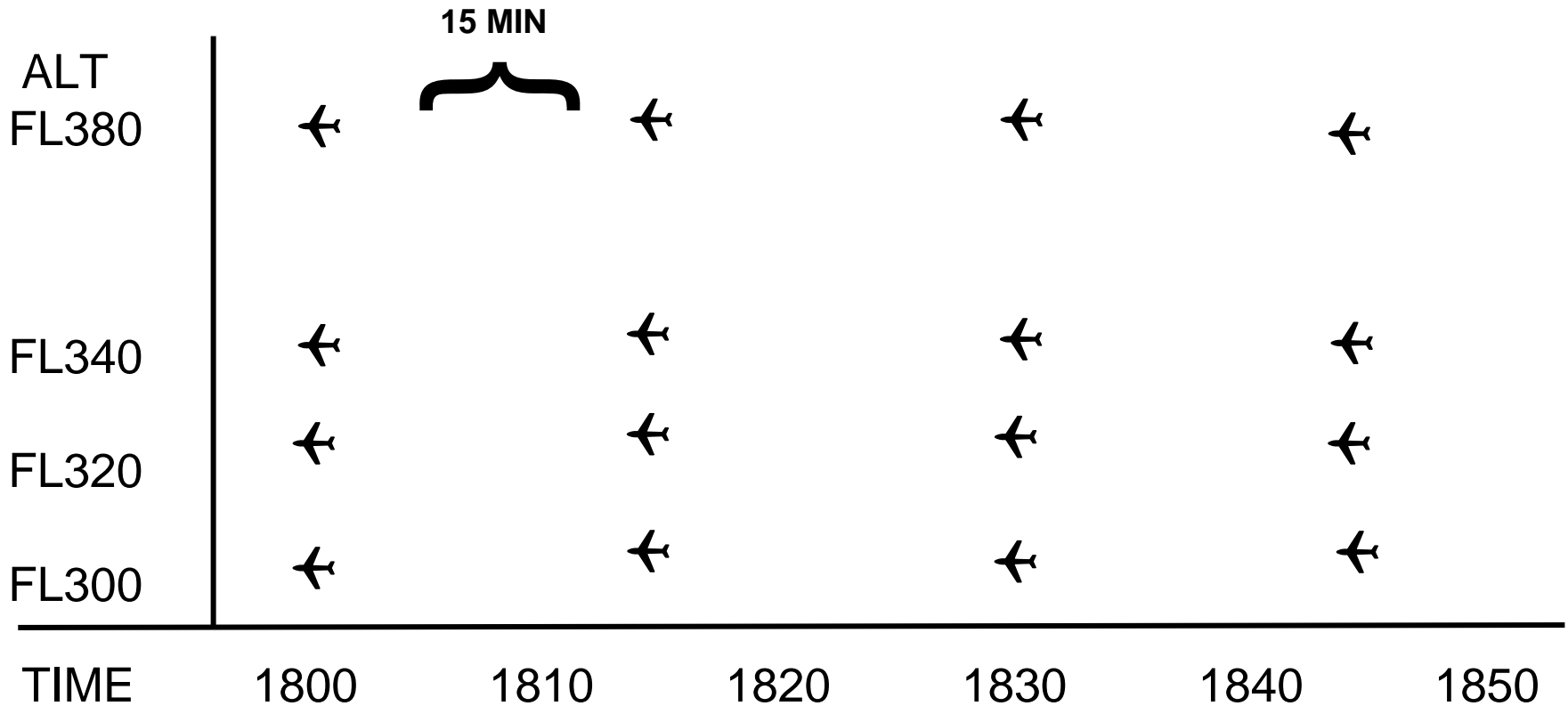
# Potential Capacity at RAMEL

## Pre-trial GRL Loading



# Potential Capacity at RAMEL

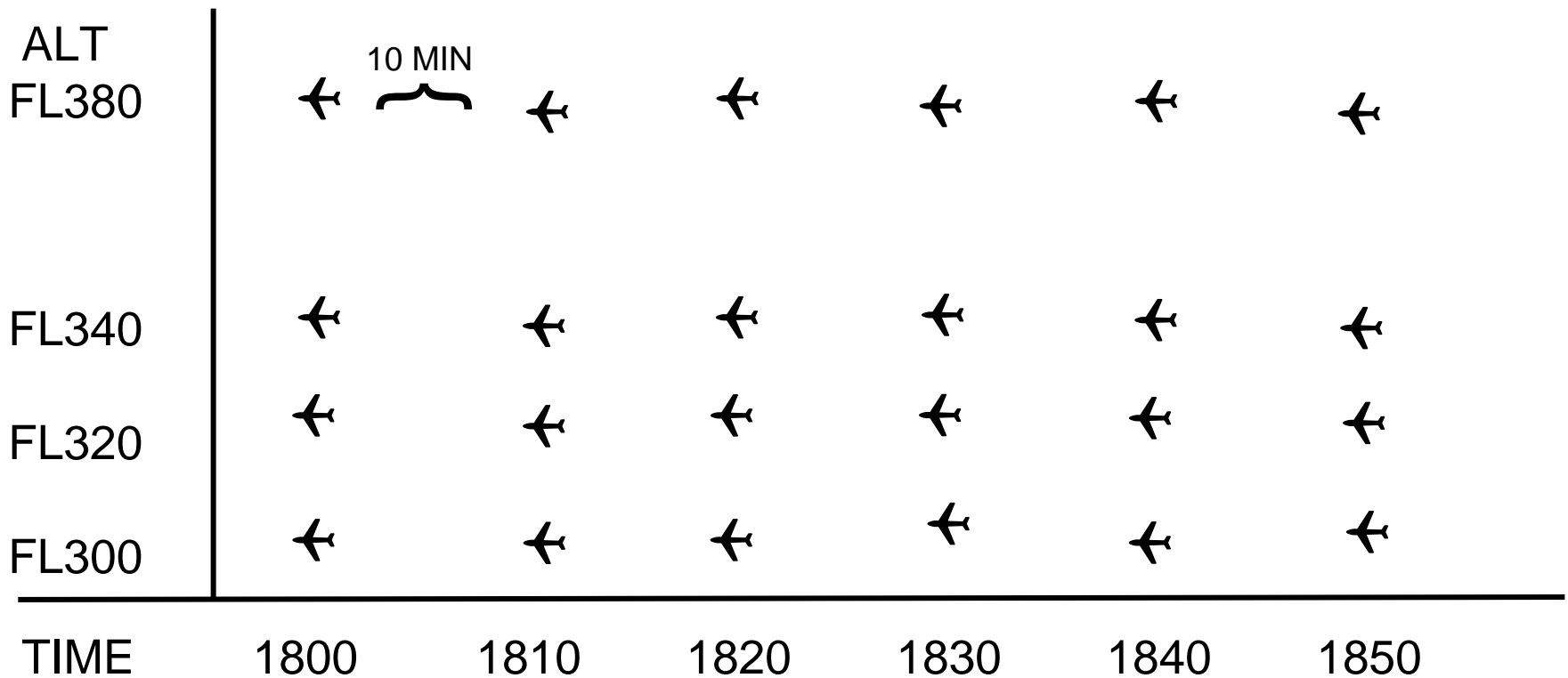
## Non-Radar Standard Separation - Random Route





# Potential Capacity at RAMEL

## Non-Radar Standard Separation - Same Route



# Outcomes of trial

- **Departure compliance deteriorated resulting in need to modify timing of conflict identification until after flights departed**
  - ATC unsure who to favor
- **Differing non-radar separation standards needed to be considered**
- **Differing aircraft performance capabilities**
  - Discrepancies between dispatchers and crews
- **Data collection indicated that GRL was not an effective traffic management tool for these routes**

# Proposed permanent procedures

- **Operators:**
  - Brief dispatchers/flight crews about this procedure.
  - Continue to comply with current track advisory procedures
- **ATCSCC**
  - Monitor ETMS to identify possible flight conflicts
  - Implement NOC recommended resolutions to potential conflicts

# Proposed permanent procedures

- **NOC**
  - Work with ATCSCC and NAV CANADA en route ATC to determine and implement an appropriate conflict resolution decision
- **ZAN TMU**
  - Maintain and operate the Polar DOTS+ Track Advisory program.

# Conclusions

- **Today capacity is not an issue for Polar routes**
  - Issue is managing conflicts between occasional pairs
- **Assignment of CDTs is not effective**
- **Means to improve probability of getting requested altitude**
  - Pass accurate fix times and altitudes to NOC/CZE
  - Common routes require less spacing

# Recommendations

- **Note the information provided**
- **Consider the following actions:**
  - Permanently adopt the trial procedures presented
  - Expand the trial using the Polar gateway procedures to boundary point LISKI beginning 7 April 2008
  - Take steps to implement a system of daily generated, wind driven flex tracks from the edge of Canadian radar airspace to the Russian Domestic FIR boundary points for ATS routes G490, B480, G491, G226 and G494

# Questions??

# Thank you!

