



**ICAO Interregional APAC/EUR/MID Workshop
(October 2-4, 2017)**

**IFATCA
System Wide Information
Management
Chances and Risks**

Presented by
Alexander Schwassmann

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Who am I?

- Air traffic controller at Langen ACC, serving at Düsseldorf APP/ACC/MIL
- Former TWR/APP controller at Düsseldorf ACC
- Member of the ICAO ATMRPP since 2011
- Member of the EASA ATM/ANS Stakeholder Technical Body (STeB)
- Private Pilot (gliders and single-engine piston)

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How many of you

- have a smart phone?
- know exactly all the contents on their smart phone?
- know exactly how to access all features of their smart phone?
- use their smart phone for online banking
- are subject to company/organisational restrictions on what they may use their mobile phone for?

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Information Management

YSSY/SYDNEY H1132/17 09MAR 2335Z

(NOTAMR H1107/17) - 413 FT AMSL BRG 014 MAG 2.78 NM FM ARP 466 FT AMSL BRG 006 MAG 3.41 NM FM ARP 203 FT AMSL BRG 014 MAG 1.46 NM FM ADP 246 FT AMSL BRG 026 MAG 2.56 NM FM ARP OBST MARKING NON STANDARD) 345 FT AMSL BRG 011 MAG 2.69 NM FM ARP 262 FT AMSL BRG 275 MAG 1.46 NM FM ARP 229 FT AMSL BRG 325 MAG 3.21 NM FM ARP 217 FT AMSL BRG 276 MAG 1.46 NM FM ARP OBST UNLIT 245 FT AMSL BRG 300 MAG 1.56 NM FM ARP 205 FT AMSL BRG 011 MAG 2.75 NM FM ARP 227 FT AMSL BRG 017 MAG 2.91 NM FM ARP 210 FT AMSL BRG 288 MAG 1.24 NM FM ARP 261 FT AMSL BRG 299 MAG 1.55 NM FM ARP 232 FT AMSL BRG 291 MAG 1.38 NM FM ARP OBST UNLIT 500 FT AMSL BRG 005 MAG 3.42 NM FM ARP 234 FT AMSL BRG 355 MAG 2.50 NM FM ARP 349 FT AMSL BRG 071 MAG 2.31 NM FM ARP OBST UNLIT 235 FT AMSL BRG 022 MAG 2.48 NM FM ARP 187 FT AMSL BRG 357 MAG 2.61 NM FM ARP 210 FT AMSL BRG 003 MAG 1.58 NM FM ARP 432 FT AMSL BRG 004 MAG 3.78 NM FM ARP 205 FT AMSL BRG 020 MAG 2.52 NM FM ARP 205 FT AMSL BRG 002 MAG 1.58 NM FM ARP 830 FT AMSL BRG 359 MAG 6.59 NM FM ARP 175 FT AMSL BRG 317 MAG 2.74 NM FM ARP OBST MARKING NON STANDARD 364 FT AMSL BRG 020 MAG 3.17 NM FM ARP 210 FT AMSL BRG 088 MAG 1.45 NM FM ARP 705 FT AMSL BRG 352 MAG 7.34 NM FM ARP 413 FT AMSL BRG 001 MAG 3.04 NM FM ARP 413 FT AMSL BRG 003 MAG 3.08 NM FM ARP 365 FT AMSL BRG 014 MAG 2.75 NM FM ARP) PART 2 OF 2. 09 MAR 23:26 2017 UNTIL 31 MAR 04:00 2017 ESTIMATED.

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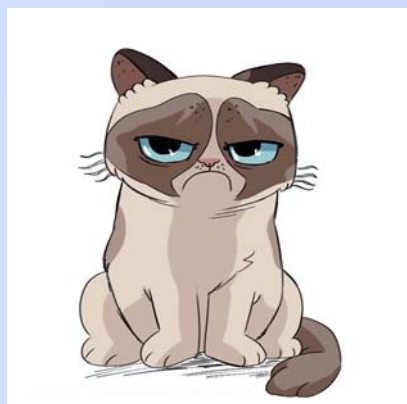
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Information Management

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-ARCID UAE3PW  
-ARCTYP A388  
-CEQPT SADE3GHIJ1J2J3J4J5M1RWXYZ
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ICAO FPL 2012
Field 10 Information



IS THIS USEFUL???



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Information Management

ICAO FPL 2012
Field 10 Information

IS THIS USEFUL???

Separation Infringement:

- ATC cleared a flight for an RNAV procedure for which the aircraft was not certified.
- Pilots did not challenge the clearance and tried to follow the procedure.
- Aircraft turned away from the procedure and came too close to another aircraft.



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Information Management

ICAO FPL 2012
Field 10 Information

IS THIS USEFUL???

Separation Infringement:

- ATC: „Pilots should not have accepted the clearance if their aircraft was not equipped!“
- Airline: „We told you we were not!“

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Information Management

ICAO FPL 2012
Field 10 Information

Yes, can be USEFUL!

Separation Infringement:

- ATC did not use Field 10 Information
- Air crew did not know requirements for that particular procedure
- **The information was all available somewhere but not where it was needed.**



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Trajectory Based Operations (TBO)

Sharing trajectory data

- Departure
- Destination
- Route of flight
- Requested Flight Level(s)

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Trajectory Based Operations (TBO)

Sharing trajectory data

Today four different trajectories

- Airline Operations Center
- ATM System (ICAO Flight Plan)
- Aircraft FMS
- ATC System (Flight Data Processing System)



Trajectory Based Operations (TBO)

Sharing trajectory data

Airline Operations Center

- Balancing economic issues, eg.
 - Flying longer routes to benefit from lower route charges
 - Changing cruising levels to profit from favourable winds
 - Carrying extra fuel because at destination fuel is more expensive



Trajectory Based Operations (TBO)

Sharing trajectory data

AT(F)M System

- calculates sector loads
- has commonly agreed handover procedures between sectors and/or adjacent ATC facilities which might be unknown to airline and/or aircraft FMS

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Trajectory Based Operations (TBO)

Sharing trajectory data

Aircraft FMS

- Calculation of optimal climb and descent path
- Calculation of time and level over each fix on the flight path
- Relies on accurate atmospheric and aircraft performance data

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Trajectory Based Operations (TBO)

Sharing trajectory data

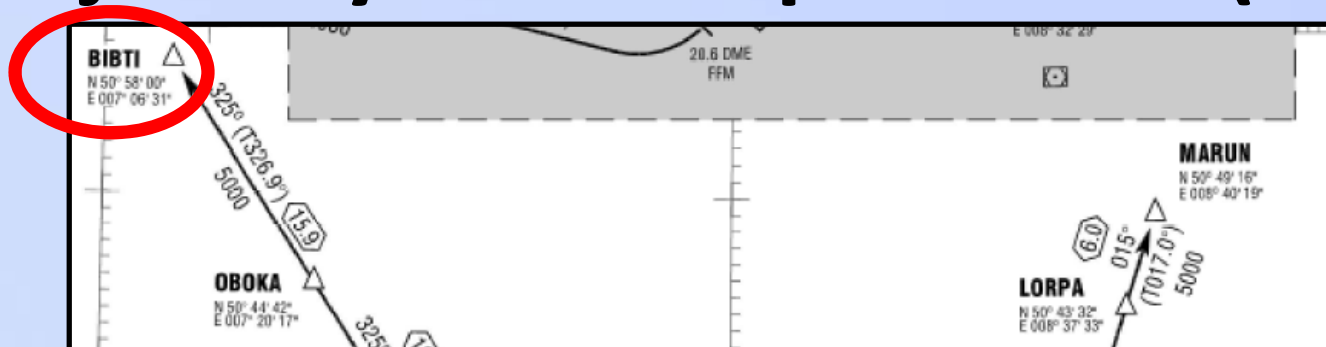
Controller Tools

- Detect conflicts based on flight plan data
- Use assumed aircraft performance
- Exception: STCA (relies on surveillance data)

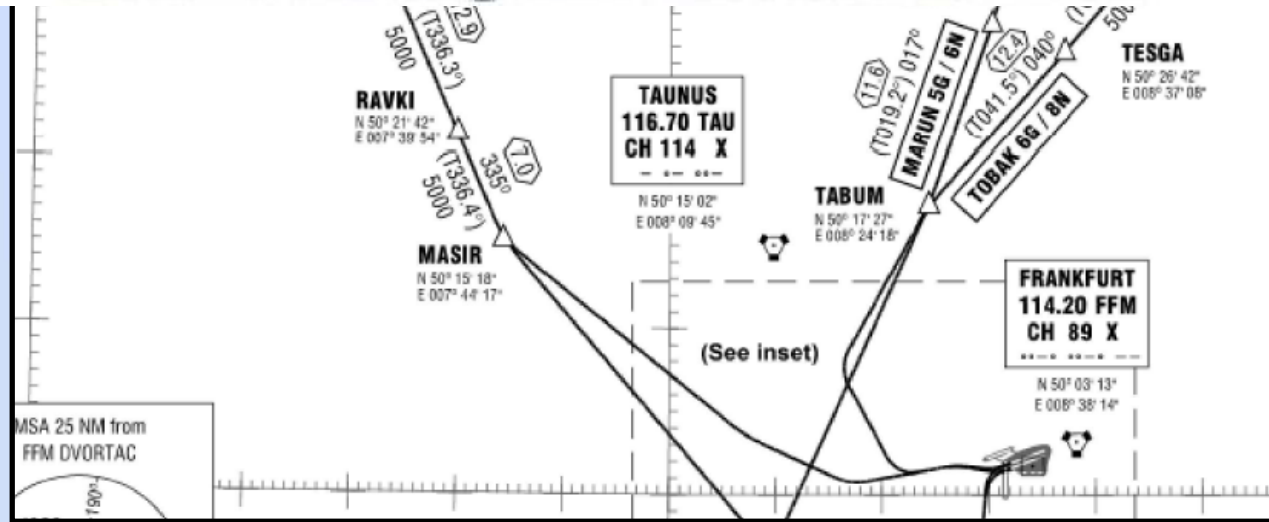
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Trajectory Based Operations (TBO)

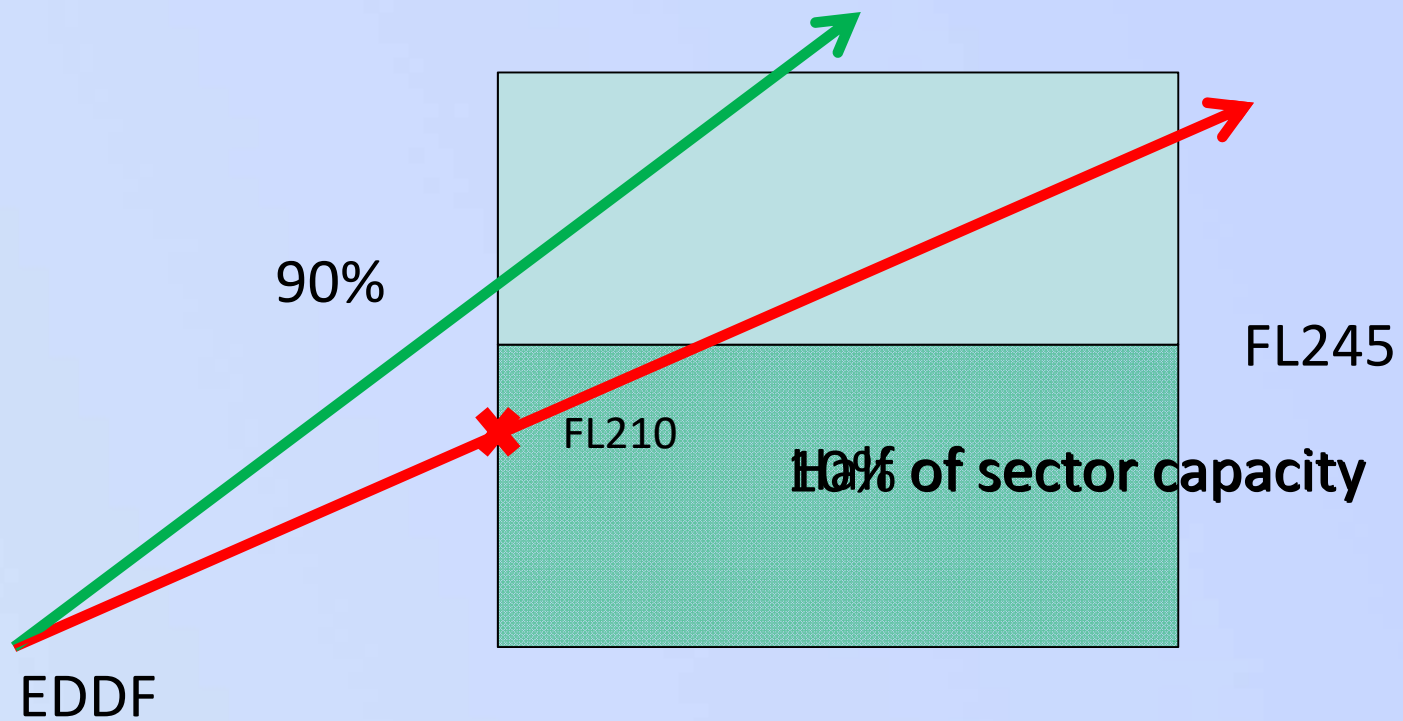


4. Flights via UZ29 have to cross BIBTI at FL 250 or above. If unable to comply, file routing via UZ28 crossing BIBTI at FL 210 or above.

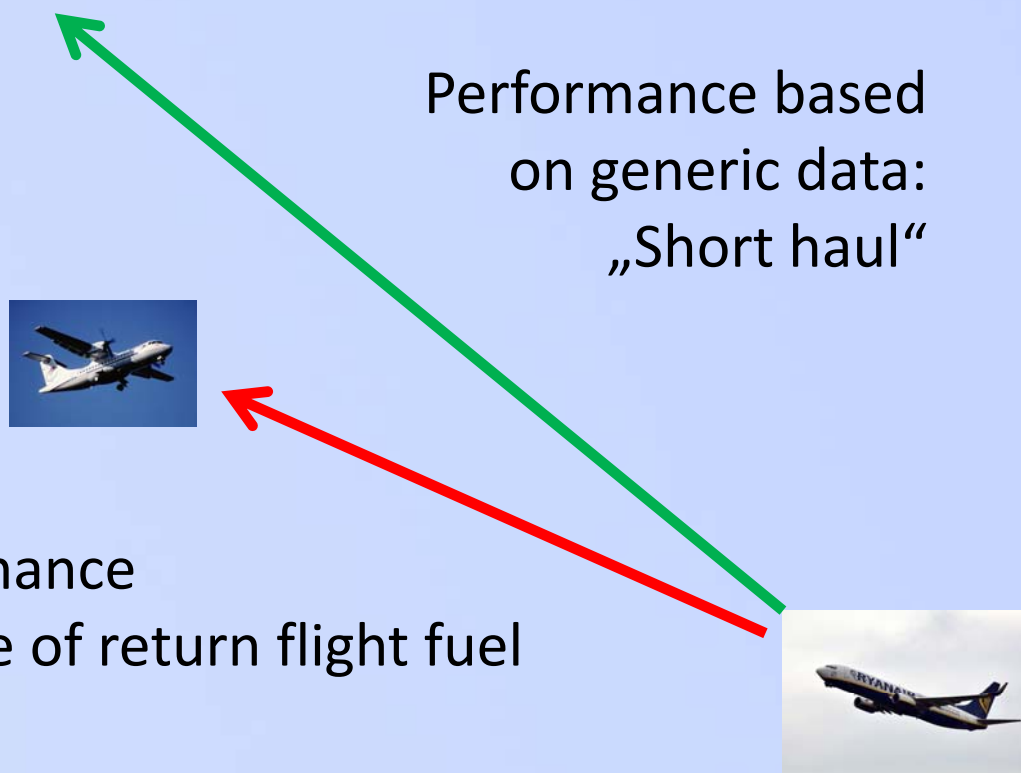


Trajectory Based Operations (TBO)

Sharing ground-to-ground: Flow Control



Trajectory Based Operations (TBO)



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SWIM

- Global Air Navigation Plan (GANP) (ICAO Doc. 9750) identifies ASBU B2-SWIM: “Enabling Airborne Participation in Collaborative ATM through SWIM”
- Aircraft envisaged as “fully connected information node”
- Exchange of data will start with non-safety critical exchanges supported by commercial data links.
- But:



SWIM

- What exactly is safety critical information?
- Example: Mode-S Downlink of Flight Intent
 - DFS radar controllers now have access to Indicated Airspeed (IAS) and Selected Altitude/Level through Mode S
 - Cleared Levels entered into the ATC System are automatically checked against the Selected Level transmitted by the aircraft
 - Mismatch generates an Alert at the CWP



SWIM

- Where does Mode-S data come from?
- Are pilots actually required to keep the Selected Level up to date and in line with their clearance?
- Do pilots know when the Mode-S data transmitted by their aircraft is erroneous?
- Can they switch off the transmissions?
- Are there procedures in place to verify that the data transmitted from an aircraft is actually usable (as per Mode-C)?

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SWIM

- So Mode-S data could be wrong and could go unnoticed
- No way for the flight crew to switch off bad data
- **But ...**

ANS Providers now want to reduce the number of STCA nuisance alerts by incorporating Selected Level data !!!



SWIM

- Content quality has to be assured, and:
- Infrastructure must be upgraded to support safety critical data.
- Risk: Infrastructure might not be upgraded to support safety critical information but would be used for that purpose anyway

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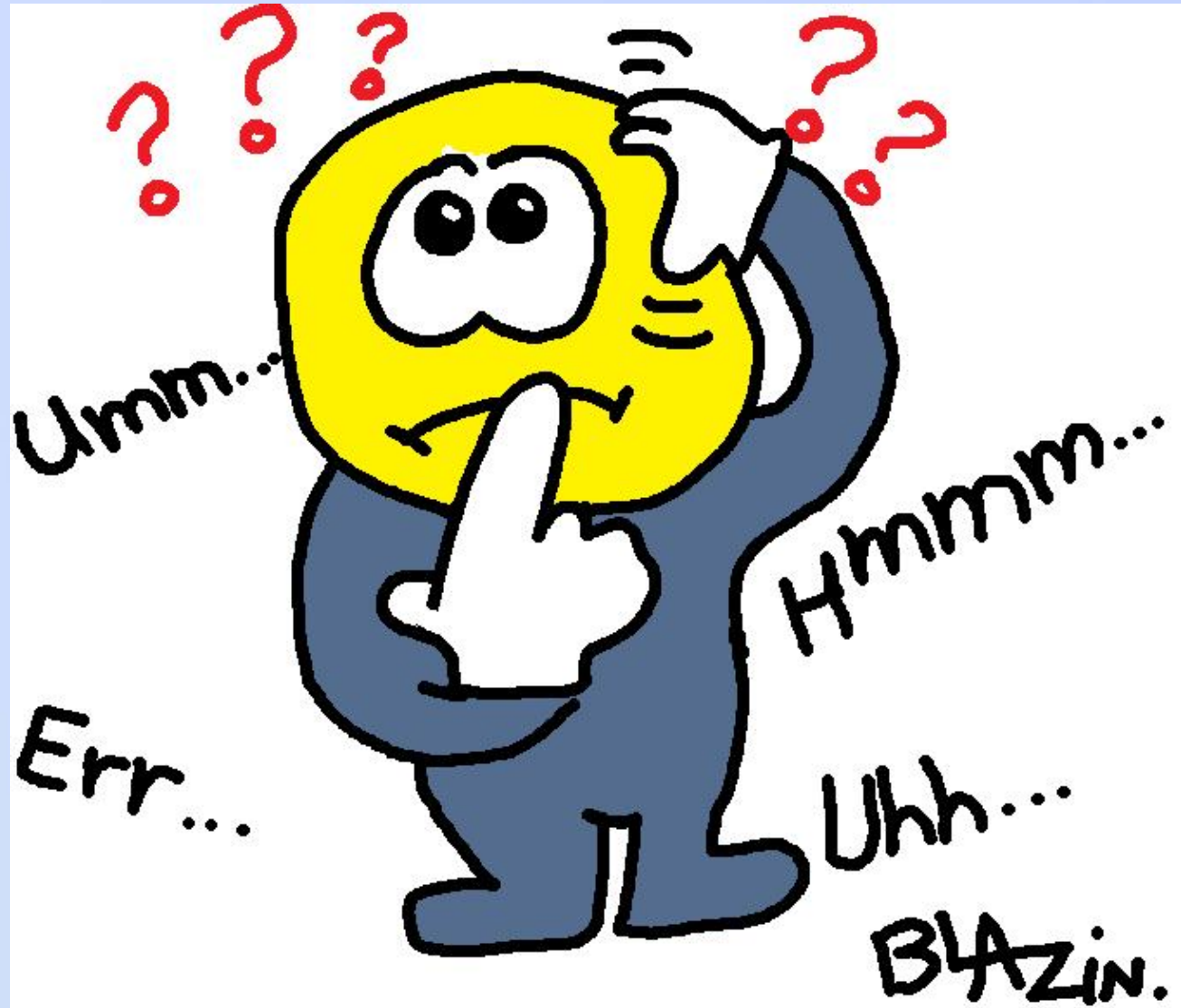
SWIM – Chances and Risks

- **Information Management:**
 - The right amount of information
 - Available to the right people
 - In a manner which they can easily use
- **Safety critical data**
 - Only verified or verifiable information
 - Transmitted over a secure network
- **Liability issues**





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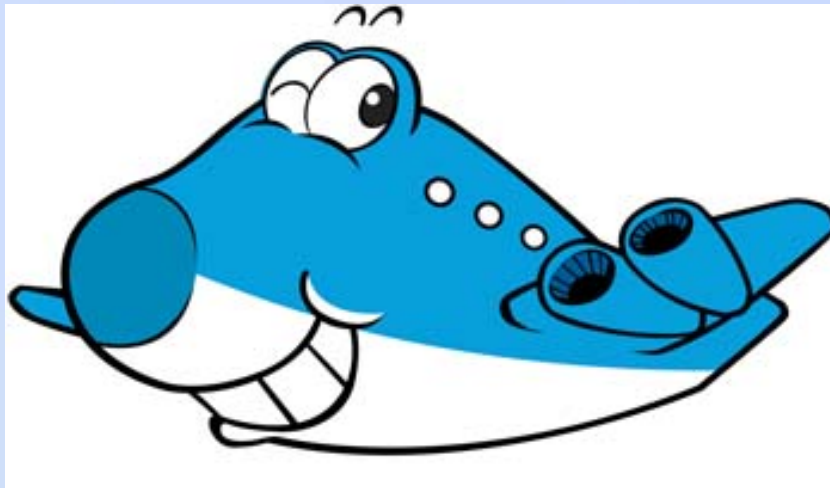


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THANK YOU!!!



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