



*Airborne Integrated Systems for Safety Improvement,  
Flight Hazard Protection and All Weather Operations*

# **FLYSAFE Final Forum**

**Involving the end users & other stakeholders**

**External Experts Advisory Group [EEAG]**

**25-26 March 2009, NLR, Amsterdam**



# Summary



- **Reminder of the objectives of the EEAG**
- **Overview & Set up of EEAG meetings**
- **Attendance**
- **Some major results**
- **Assessment & member's availability**
- **Financial Aspects & Lessons learned**
- **Conclusions & Recommendations**



## Reminder of the objectives of the EEAG



- **At project start and on going:**
  - **Receive practical inputs from member's daily experience**
  - **Identify "total operational system" incompatibilities & deficiencies**
  
- **In the design phase:**
  - **Periodic reviews on the approach taken and the interim results**
  - **Feedback from your own perspectives**
  
- **At the final stage:**
  - **In view of the project results, please advice on the best way to go towards marketable and certifiable products and systems**



## Overview EEAG meetings



<b>EEAG 1</b>	<b>10 &amp; 11-05- 2005</b>	<b>43 issues identified &amp; discussed</b>
<b>EEAG 2</b>	<b>07&amp; 08-02- 2006</b>	<b>25 issues identified &amp; discussed</b>
<b>EEAG 3</b>	<b>06 &amp; 07-02- 2007</b>	<b>33 issues identified &amp; discussed</b>
<b>EEAG 4</b>	<b>12 &amp; 13-02- 2008</b>	<b>19 issues identified &amp; discussed</b>



## Set up EEAG meetings



- **All EEAG meetings have been organised in 2 half-days**
  
- **Meetings cover many topics with different stakeholders**
  - ◆ **Airborne operations, with airlines and pilots**
  - ◆ **On-ground operations, with Airport and ATM representatives**
  - ◆ **Certification authorities, with EASA, CAA-XX, etc.**
  
- **Day 1 afternoon:**
  - ◆ **Introduction and overview**
  - ◆ **Feedback previous EEAG meeting**
  - ◆ **Brief WP's presentations**
  - ◆ **Reactions from EEAG members (Possible presentation by EEAG members)**
  - ◆ **Specific FLYSAFE queries to EEAG**
  
- **Dinner at the hotel: 20:00**
  
- **Day 2 morning:**
  - ◆ **Discussion session on specific items**
  - ◆ **Wrap up**



# Attendance meetings & forums

- EEAG comprises 34 members

	EEAG 1	EEAG 2	EEAG 3	EEAG 4	Members
<b>Attendance</b>	<b>30</b>	<b>39</b>	<b>33</b>	<b>43</b>	
<b>Airborne ops</b>	<b>4</b>	<b>7</b>	<b>3</b>	<b>6</b>	<b>11</b>
<b>ATM</b>	<b>1</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>11</b>
<b>Authorities</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>3</b>	<b>6</b>
<b>Weather</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>EC Reviewers</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>

- Some EEAG members participated in Forum activities

- **FLYSAFE Forum 1: Eurocontrol HQ**                      **Brussels, June 2006**
- **FLYSAFE Forum 2 & 5th ASAS-TN2;**                      **Toulouse, Sept. 2007**



## Some major results (1/4)



- All questions from the FLYSAFE team have been addressed
- Real world feedback proved to be very valuable
  - Meetings and Presentation days
  - Questionnaires
  - Participation in Part Task Evaluations (PTE's)
- Highlights:
  - Wide range of views on development of the traffic management
  - Traffic stream impacts rather than to one individual aircraft only
  - Strategic: Conflict detection & conflict avoidance handling (incl. ATC)
  - Tactical: Conflict detection & resolution
  - Use of **strategic information** / **tactical information** / **safety net**
  - Automatic recovery not supported
  - Consolidated view on terrain awareness presentations



## Some major results (2/4)



### ■ Atmospheric Threats & WIMS

#### ● Meteorological Institutional issues via questionnaire.

10 questions including:

- ◆ Free market or regulated supply of met data?
- ◆ Which organisations) should provide each stage to process raw data provision to communication to an aircraft?
- ◆ How are the stages funded?

#### ● Example, response to "Should WIMS products be regarded as being part of the regulated data stream or part of the de-regulated stream?" respondents voted 17-0 in favour of the regulated data stream.

#### ● Responses will be used to guide the work of the institutional issues working group



## Some major results (3/4)



### ■ Traffic

- Definition of Traffic symbology and display rules to avoid clutter
- Taxi Map display options to minimise runway incursions

### ■ Terrain

- Feedback on TAWS developments, esp. VSD & Safety Altitudes

### ■ NG-ISS

- Some EEAG members were evaluators for ICS PTE
- Valuable comments received on HUD Traffic & Terrain HMI



# RCAF Open day



**RCAF video at <http://uk.youtube.com/watch?v=xc6iFTDLhek>**



# Traffic Presentation Day





## Some major results (4/4)



- **EEAG crewmembers also participated in questionnaires regarding:**
  - **New options for terrain avoidance**
  - **Operational needs for Cockpit Display Systems (including HUD)**
  
- **Testing & Validation:**
  - **Feedback of different stakeholders received**
  - **EEAG members have participated in some of our PTE's**



# NG-ISS integration PTE



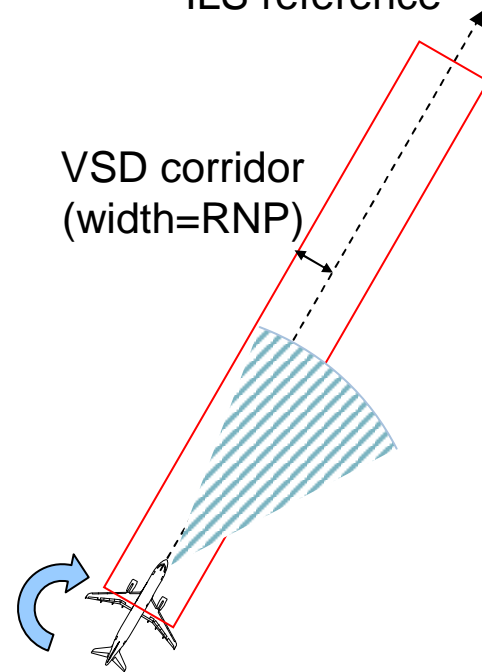


# Concepts for Vertical Situation Display



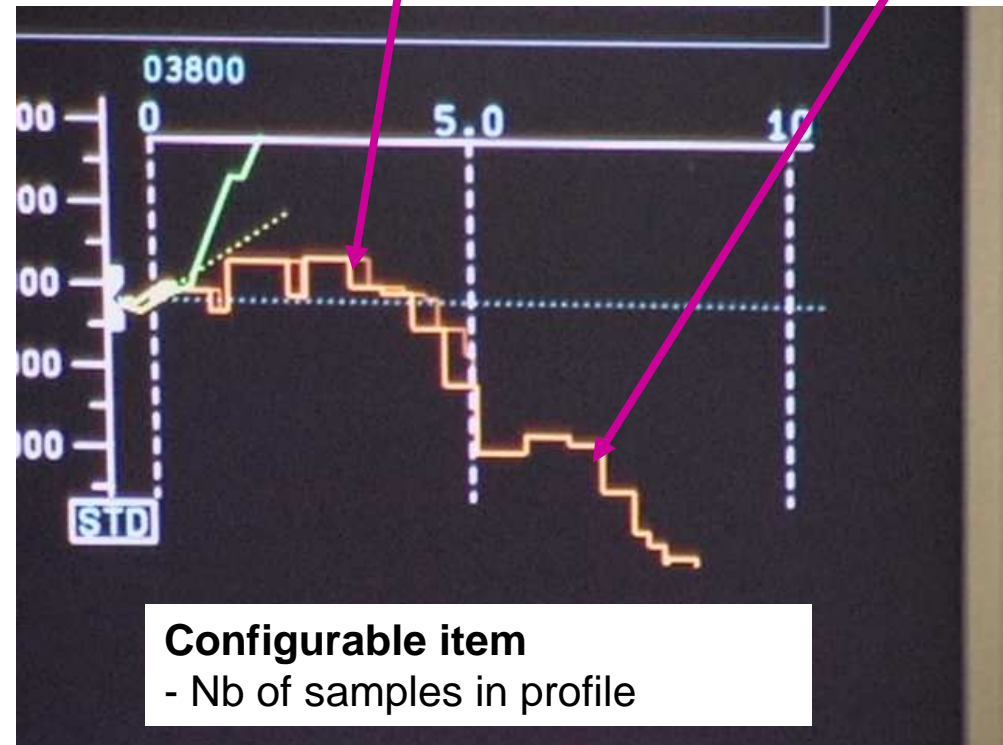
## 4 possible reference trajectory:

- Track
- FMS trajectory
- Pilot selected azimuth
- ILS reference



## 2 selectable profile display modes:

- Simple profile
- Double profile (a.k.a conical view)





# VSD items to investigate (1/2)



Jumpiness in profile

A/C symbol + attitude

VSD level of details

Coherence THD / VSD



# EEAG Assessment



- **EEAG meetings have demonstrated to be a success**
  - **High number of participants**
  - **Relevant output to adjust the work within FLYSAFE**
  - **EC reviewers repeatedly gave very positive assessments of the EEAG**
  - **EC reviewers stated “an essential tool to verify whether still “on track” to the goal”**
  
- **EEAG members have sometimes participated as evaluators in experiments**



## EEAG member's availability



- **Availability of EEAG members requires extra attention**
  - Many EEAG members have ***no funding*** to attend
  - Many EEAG members have busy schedules
  
- **Mitigations:**
  - Pro-active personal contact to approach EEAG members
  - Active participation of local EEAG members in PTE's (minimise travel costs)
  - Use electronic means (emails, FDR, etc.) for distributing information and asking for help
  - Thales has funded presence of certain members at EEAG meetings



## EEAG Financial Aspects



- **Paying travel costs required to attract the required external people**
- **EEAG hotel & travel expenses per event approx. 20.000 Euros**
- **In FLYSAFE the co-ordinator THALES has covered these costs**
- **Suggest to discuss sharing these with all partners in future projects**



## EEAG Lessons Learned



- **Personal contacts, team building & early invitations needed for commitment**
- **Convenient location with many connections is almost a “must”**
- **Document repository is to be provided for the external experts**
- **Participation in PTE’s of EEAG members often not possible (funding!)**
- **Reimbursement of visitor’s hotel & travel expenses needed**



# EEAG Conclusions



## ■ EEAG Conclusions:

- **EEAG meetings are essential stepping stones for project progress**
- **The contacts are extremely useful in between meetings as well**
- **Minimise travel costs for EEAG members in any activities to maximise involvement**



# Recommendations



## ■ EEAG Recommendations:

- Future projects should consider reviewing by external parties
- Other projects may profit from inputs from FLYSAFE's EEAG (e.g. SESAR, ALICIA etc.)
- As External parties have no budget for review work consider asking for **100% funding of review activities** in future projects
- If 100% funding is not available:
  - ◆ Share these costs with all partners in future projects



# Thank you !



**Departure from LAX; MD-11; Sunrise over Long Beach**