EVAIR Safety Bulletin
No 8

Summer Seasons
2008-2011

EUROCONTROL

CONTENTS

EVAIR MANAGER'S PERSPECTIVE

The EVAIR team has the pleasure to bring you EVAIR Safety Bulletin No 8. The issue covers the summer seasons 2008-2011. The graph below shows that until summer season 2010 there was a constant increase in the number of incident reports per 10.000 operations. Summer 2011 showed for first time a decrease. In absolute figures summer 2011 still has a higher number of incidents.

Data collection

The sole aim of EVAIR is to improve flight safety by collecting ATM-related safety information from data providers (airlines and ANSPs) analysing it and identifying areas of safety concerns.
For the summer periods 2008-2011, 116 airlines provided their ATM incidents to EVAIR. The reporting airlines fly across the whole of Europe and account for more than 70% of the overall European air traffic.

It is very important to highlight that besides the provision of the feedback, ANSPs have started to provide an increasing number of their own incidents. The most common occurrences involve laser interference, Callsign similarities and TCAS RAs collected automatically. In the future, we expect that the data originated by ANSPs will be wider, ideally covering the complete spectrum of ATM activities.

Verification of EVAIR data

EVAIR has established a process to cross-check the robustness and quality of its data with that of the airlines associations (IATA). Cross-checks are also undertaken with the best reporters among the airlines and the best feedback providers amongst the ANSPs. These checks also verify the correctness of any identified trends. This Safety Bulletin, like previous ones, enables our readers to see the comparative data between EVAIR and IATA STEADES statistics covering, for example, Go-around, Runway incursion, ACAS RA, Level Bust and Callsign confusion. It is important to note that although one database is European and the other Global, there are similarities in the general trends identified for the events listed above for a period of 3-4 years.

Feedback – Support to quick fixes

The feedback mechanism continues to be the driving factor for the increased reporting and motivation for new data providers to join us. During the summer periods 2008-2011, EVAIR addressed requests for feedback from approximately 60 different airlines to about 40 different ANSPs within and outside Europe. Requests for feedbacks cover all type of events.

It is noteworthy that the feedback practice for Callsign similarities established between the airlines, ANSPs and EUROCONTROL show very good results even though everything is on a voluntary basis. Namely after the identification of a similarity between two (or more) aircraft form different airlines the process of negotiation between them meant that in the majority of cases the airlines took the necessary steps to change one (or more) conflicting Callsigns. There have been only a few cases where a solution could not be found and most of these are because the flight schedule is linked to overflight approvals.

The usual feedback response time varies from a few days to a few weeks, but very occasionally this stretches to several months. It is encouraging to see that the feedback response time for some ANSPs has reduced significantly following the initiation of regular meetings between the ANSPs and airlines. These meetings provoke a better understanding of their mutual concerns and we hope that they will continue.

Main trends:

Phases of flights

Traditionally the largest number of reports concern incidents in the Approach phase. Summer 2011 saw across all phases of flight a drop in the number of reports, the first such decrease seen for 3 years. Further monitoring will show if the trend will continue and if it is related to the improvement of safety performance or decrease of reporting.

Events

Among five different types of events presented in this Safety Bulletin, Go-Around which had a very high increase in summer 2010, fell by 23% according to EVAIR data and by 5% according to IATA STEADES data in 2011. As with other type of events which recorded a reduction, it is difficult to say if it is due to better performance of both airlines and ANSPs or if there are other reasons behind the decrease. Further monitoring should give the answer.

Main Contributors to incidents – As during the summer 2010, in 2011 'Mistakes' and Air-ground communication, which encompasses spoken and operational communication, are the areas with the highest trends. They account for 56% of the overall contributors to the main five events recorded by EVAIR, namely: Go Around, RWY incursion, Level Bust, ACAS RAs and Callsign similarities It is important to note that 'Mistakes' and Air-ground Communication, recorded a decrease in Summer 2011. Training could be a fruitful place to begin looking as a solution to the listed problems.

ACAS RA data collection

In this Safety Bulletin we present for the first time data collected automatically by two ANSPs from a total of 13 Mode-S radars. EVAIR follows the established practice that ACAS RA data are analysed by air traffic controllers, EUROCONTROL ACAS experts, and when necessary, pilots too.

EVAIR also collects ACAS RAs manually based on reports from pilots through the airlines' SMSs. Together with the automatic data, the aim is to support the safe operation of ACAS by identifying and measuring issues associated with RAs and their trends, and taking preventive measures where necessary.

Laser Interference

In response to a steady increase of laser interferences EUROCONTROL organized a seminar (10-11 Oct 2011) which attracted the attention of a wide range of European stakeholders: regulators, ANSPs, airlines and their associations, IATA, IACA, ERA, police, professional associations, IFALPA, IFATCA, science and new technologies, ICAO, Europan Commission, EASA, police, etc.

Participants at the seminar agreed that timely and effective in-flight and post-flight procedures for dealing with interference are needed - as well as training in these procedures for both pilots and air traffic controllers.

The seminar concluded by calling on the European Union to develop stringent regulation on the production, distribution, purchase, carriage and use of lasers. It is noteworthy that in some European states laser perpetrators have been arrested and prosecuted.

Callsign Confusion

Previous EVAIR Safety Bulletins have featured the monitoring activity involving the EUROCONTROL Callsign Similarity (CSS) Project. This project aims to reduce the incidence of Callsign Similarity/Confusion. The way to reduce the CSS/C is the establishment of a pan-European coordinated Callsign Similarity Service and Tool provided by the Callsign Management Cell (CSMC), which is a part of EUROCONTROL's Directorate Network Management (formerly CFMU).

Testing of the EUROCONTROL Callsign Similarity Tool is ongoing with a growing number of aircraft operators taking an interest. Indeed, two airlines used the Tool to de-conflict their Winter Season 2011-12 schedules and the results so far have been impressive with virtually no reports of 'single AO' similarities (i.e. a similarity involving two aircraft from the same company) recorded for these two airlines.

EVAIR continues to monitor Callsign similarity data and will work closely with the NM CSMC to assess the effectiveness of the Tool/Service when it is formally launched in March 2012.

Comparison of the trends between IATA global and EVAIR European Callsign similarity/confusion data for 2008-2011, show similar movements in terms of the increase/decrease.

Stakeholders' Corner – IATA

Following the established practice to have the inputs from the airlines or their associations, in this issue as in previous ones, we enable to our readers to have a look at the comparison between the EVAIR and IATA STEADES statistics. This is done on selected categories of events (Go-around, RWY incursion, Level Bust, ACAS RAs and Callsign similarities). It is important to highlight that both databases represent officially non-investigated and voluntarily provided incident reports.

For this Safety Bulletin the Air Safety Reports (ASRs) were extracted from the IATA STEADES database from approximately 130 participating airlines. The analysis cannot confirm if events associated with the categories analyzed were solicited equally among all participating airlines nor if such events were reported routinely or underreported by flight crew. Airline Air Safety Report data submissions to STEADES is a dynamic process. Data can vary from one quarter to the next, meaning that not all participant's data is incorporated each quarter. This can be due to a participant not submitting data (due to a technical problem) or IATA not incorporating the submitted data (due to data format technical issues or data not meeting IATA's data quality standards). IATA accounts for this in the calculation of sectors / number of flights to ensure that rate based information is meaningful, and IATA uses other quality processes to recover missing data. Due to these factors, rate based comparisons are preferable to a comparison of the number of reports. The reader should also be mindful that the data and rates presented in the Bulletin are based on events reported by flight and cabin crew and therefore influenced by airline reporting cultures.

With the exception of Altitude Deviation reports (Level Busts), where the rate remains steady over the period analysed, the categories showed increased rates from the summer period of 2008 to 2011. These increases may be due to a number of factors including improved reporting cultures and new airlines joining STEADES. Of concern are Runway Incursion reports, which increased year on year during the period analyzed. It is interesting to note that all five of the event types analysed may be related to traffic density, meaning that errors are likely to increase as traffic (and pilot/controller workload) increases.

Security and Confidentiality

In collecting and processing data, EVAIR follows strict security and confidentiality arrangements. Safety data provided are properly safeguarded and de-identified and the information is only used for the promotion and enhancement of aviation safety.

EVAIR Suggestions/Improvements

EVAIR is constantly looking at ways to improve its services and products. Suggestions and proposals are more than welcome. Please forward any thoughts, ideas and comments to:

Ms Dragica Stankovic
EVAIR Function Manager
dragica.stankovic@eurocontrol.int

INTRODUCTION TO STATISTICAL DATA

The statistics presented in EVAIR Safety Bulletins are based on incidents received from commercial aircraft operators and feedback data provided on some of them by ANSPs. Incident reports are very much based on the subjectivity of those who were involved and in the first place the pilots who filed the report and described the occurrence. However, improved feedback processes through which EVAIR is provided with a reply either by Air Navigation Service Providers (ANSPs) or airlines - the two main stakeholders participating in the incident - improves significantly the view and the knowledge about the causes of the analysed events. **EVAIR statistics do not contain severity analysis**, since the analysed reports are not officially investigated or the official (airline/state) investigation is still waiting to be closed. Nonetheless, the statistics do provide a general view and show some main trends of the current operational safety acceptability.

EVAIR activity covers the whole ECAC airspace as well as some of the airspaces neighbouring with the ECAC region like Eastern part of the ICAO EUR region, Middle East, Africa etc. In the same way, the airlines and ANSPs who participate in EVAIR come from across Europe and, indeed, some airlines based outside of Europe but who regularly fly through European airspace.

EVAIR Safety Bulletins are issued twice per year. One covers the whole year period whilst the other, such as this one, only the summer season (April- September). Data for the summer period 2008-2010 are provided by more than 120 airlines and for the summer 2011 by 116 airlines. When solicited, all ANSPs have provided feedback to airline reports.

Notes:

1. In this EVAIR Safety Bulletin within the manual part of reporting, only relative figures are presented - i.e. the number of reported occurrences per 10,000 flights of the airlines participating in the reporting. Within the automated ACAS RA data collection sections, the data comprises absolute values.
2. The graphs which identify causal factors could count the same incident more than once. The reason for that is that one incident could be associated with more than one causal factor.

Definitions:

Definitions for each element contained in the graphs can be found in the Annex 2.

SECTION 1 - ATM EVENTS AND SUPPORT TO EUROPEAN ACTION PLANS

As usual in this chapter, EVAIR presents some of the events which are already addressed in the European Action Plans or projects like Air-ground communication, Level Bust, Runway Incursion, ACAS, and Callsign Similarity/Confusion, Missed approach/ Go-around etc. In order to assist to our readers and data providers to have better picture regarding the above mentioned events we provide the EVAIR view on the European situation and IATA STEADES global view. This provides better monitoring of the situation and draws attention to the negative or positive trends which still require corrective actions for further improvements. It also assists in prioritising actions which could be taken on a pan-European level.

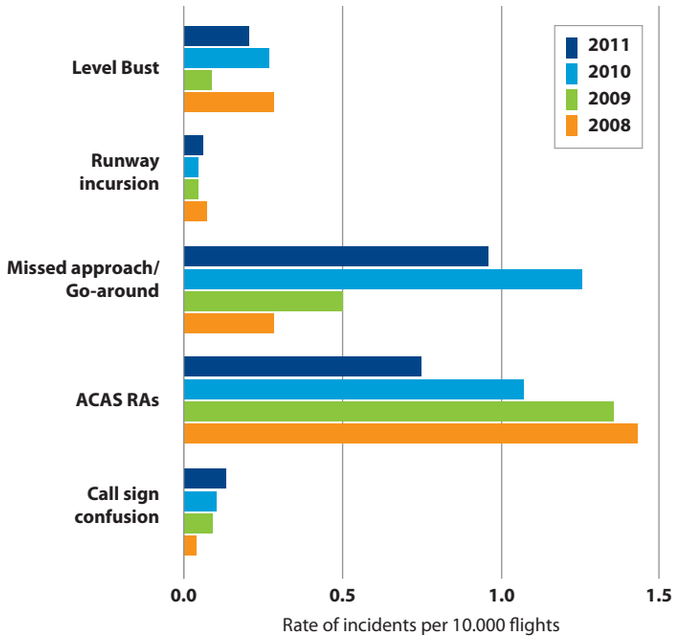


Figure 1
ATM Events Summer seasons 2008 – 2011

Within the EVAIR database the comparison between the summer 2011 and 2010 ATM events recorded a decrease in three out of the five analysed types of events, i.e. Go-around/Missed approach , Level Bust (down by 21%) and ACAS RAs.(reduced by up to 30%). On the other hand, the number of recorded Callsign Confusions incidents rose by 20.5% and Runway Incursion by 16%. It is very difficult to say if the decreases were because of improved safety performance or less reporting. It could be possible that some of the reduction could be attributed to a more pro-active approach to the safety by airlines and ANSPs and their direct contacts in a lot of cases facilitated by the EVAIR feedback process. Monitoring of the feedback process shows that the process is maturing. An increasing number of ANSPs and airlines understand its importance and added value and want to participate in it. As an illustration, in the summer season 2009 we were receiving one feedback on every 38 incidents; however, in the summer seasons 2010 and 2011 we were receiving one feedback on every 10.8 to 10.5 incidents. Despite this significant improvement in the feedback response rate, there is still a lot of work to do so that, ideally, feedback is provided for every report that warrants consultation between the affected parties.

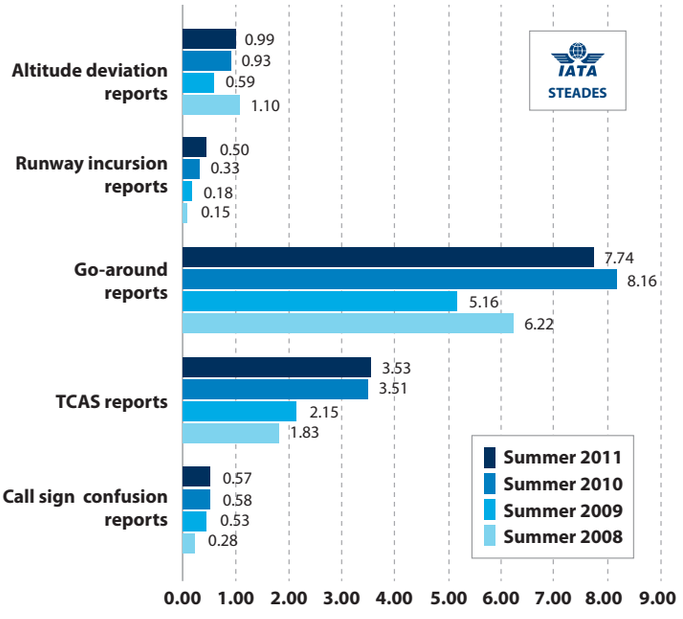
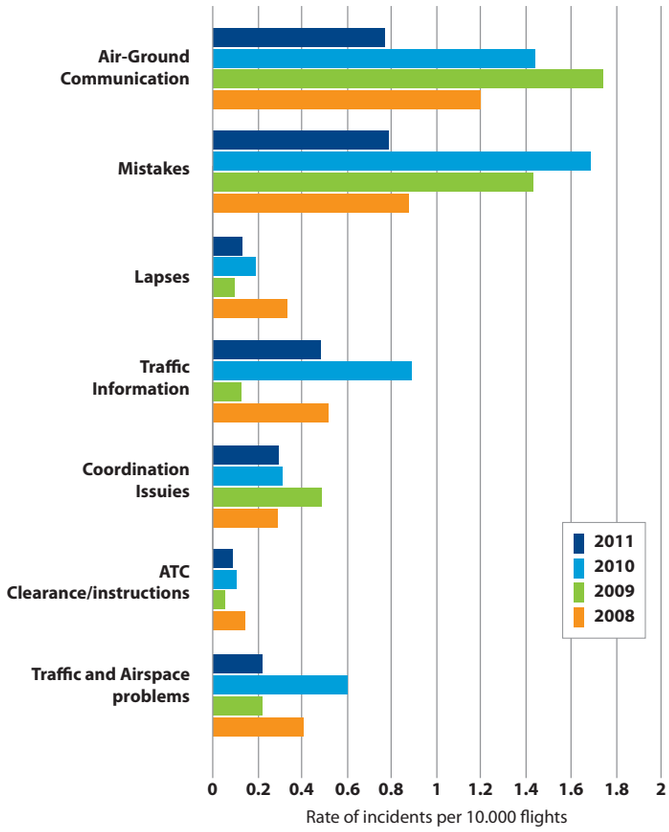


Figure 1a



CONTRIBUTORS TO ATM OCCURRENCES

ATM contributors presented in the figure 2 are spread across all phases of flights and linked with the five selected events shown at figure 1. 'Mistakes' and 'Air-ground communication' (Operational and Spoken) are the most common contributors through the summers 2008 – 2011. However the comparison between summer 2011 and 2010 shows a significant decrease in the number of incidents related to the 'Air-ground communication' and 'Mistakes'. 'Air-ground communication' had a decrease of 47% and 'Mistakes' fell by 53%. It is interesting that these reductions are much higher than the general decrease in the number of reports for the summer 2011, which was 22.4%. The highest decrease of 62.5% was recorded for the 'Traffic and airspace contributors'. These contributors even dropped below the level which they had in 2008 although there were 22.5% more incidents in 2011 versus 2008. Further monitoring should show if this is a continuous trend.

Figure 2:
Summer Seasons 2008 – 2011
Contributors to ATM incidents – all phases of flight

GO-AROUND

The reason that EVAIR decided to monitor the trend of the 'Go-around' events is to identify the safety barriers which failed on the ATM field and forced pilots to execute 'Go-around procedure'. Identification of those causes and their mitigation and possible elimination has direct impact on the safety improvement but at the same time on the improvement of the flight efficiency and increase of capacity. Previous monitoring of 'Go-around' events showed that in comparison with the other type of events, the growth trend for Go-around' was higher. It is therefore important to note that after three years of increases, during the summer 2011 the number of 'Go-around' recorded events showed a decrease. The decrease in the summer 2011 was observed by both EVAIR and IATA STEADES databases. EVAIR recorded a decrease of 23% while STEADES recorded a reduction of approximately 5%. Further monitoring should show if this trend will continue and whether the four years' trend, which still has an upward trajectory, will start going down. The data shows that there is no room for complacency and further work has to be done. In this regard EUROCONTROL has started a 'Go-around' project which should further contribute to the decrease of the 'Go-Around' events - which are sometimes, but not always, preceded by a breakdown of one (or more) safety barriers.

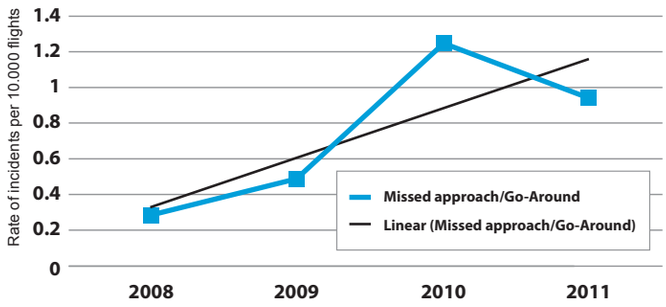


Figure 3:
Missed approach-Go-around
Summer seasons 2008-2011

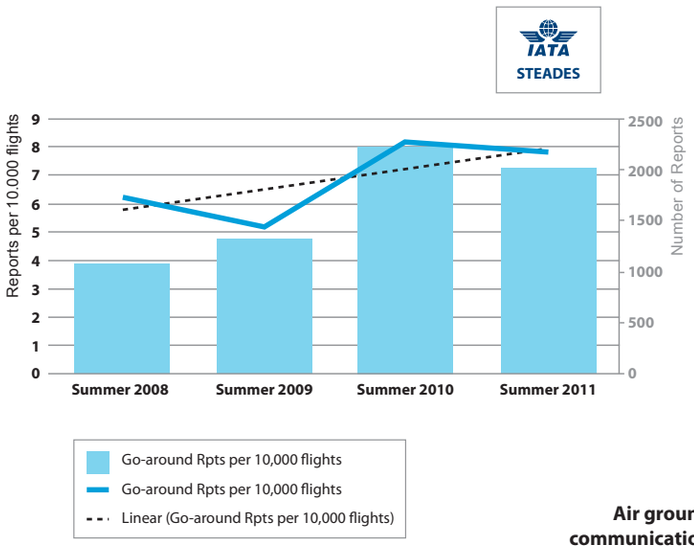


Figure 3a:
Go-around reports Summer seasons 2008-2011

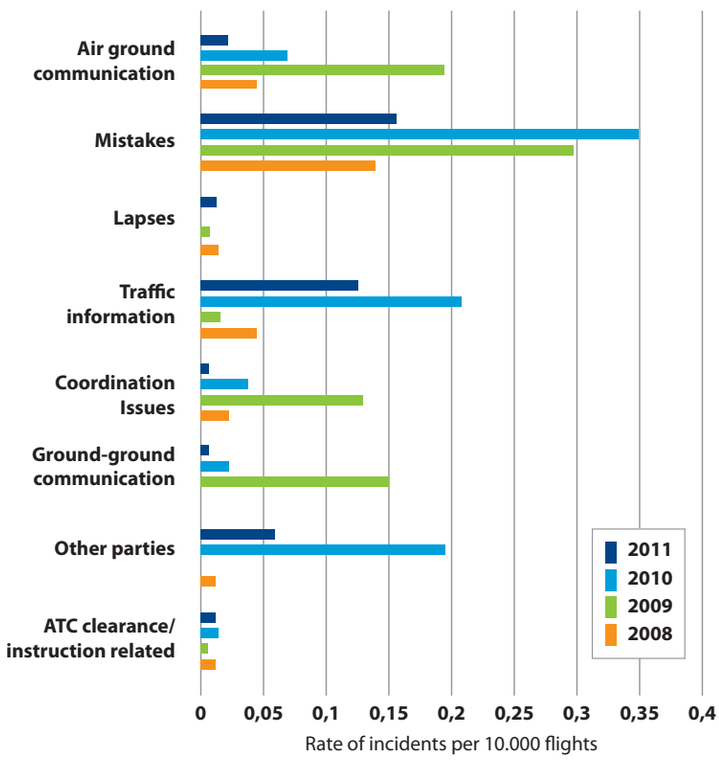


Figure 4:
Go-Around contributors
Summer seasons 2008-2011

It is very encouraging to see that contributors to 'Go-around' identified by EVAIR recorded a significant decrease. 'Mistakes', which are usually the contributor with the highest trend, reduced by 55.8%. However, the contributor with the highest decrease was 'Other parties' which incorporates vehicles, people, animals on the ground, birds in the air etc.

RUNWAY INCURSIONS

For the last three summer seasons (i.e.2009-2011), the EVAIR database recorded an increase in the number of 'Runway incursions'. The IATA STEADES database shows a similar pattern (Figures 5 and 5a). It is important to recognise, however, that it is not possible to properly compare the trends between 'Runway incursion' and the other type of events and the data needs to be interpreted with care. Namely, the 'Runway incursions' trend is still far below the other type of the events like, 'Go-around' and 'ACAS'. However, the risk of a serious incident or accident for 'Runway incursion', as identified by the ATC experts, is much higher than for the two mentioned events. Relative figures for 'Runway Incursion' as well as for other types of the events within the STEADES database are much higher than within EVAIR. [1]

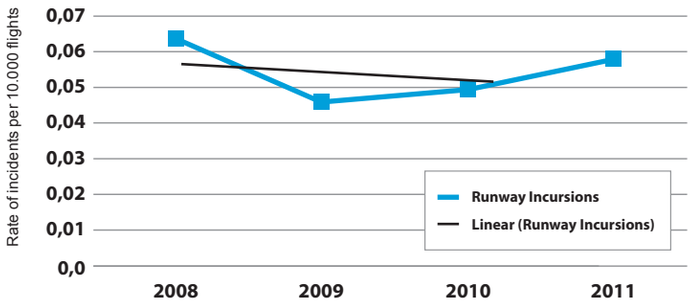


Figure 5:
Runway Incursion Summer seasons 2008-2011

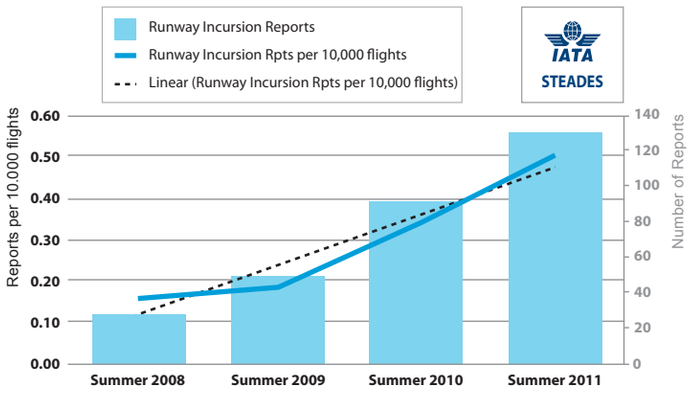


Figure 5a:
Runway Incursion Reports
Summer seasons 2008-2011

[1] Throughout the report, relative figures and reporting rates are lower in the EVAIR dataset than in STEADES. Whilst several reasons for this may exist, it is noteworthy to mention: 1. Airlines that cooperate with EVAIR do not provide all reports, they provide mainly reports for issues where they seek feedback from the specific ANSP and which is facilitated by EVAIR. Whereas the airlines participating in IATA's STEADES program provide all their air safety reports to STEADES as part of their agreement with STEADES. 2. The higher reporting rates in STEADES may also be attributable to the fact that STEADES coverage is global. This means that regional differences and/or deficiencies in ATC performance, ATM/CNS infrastructure, applied standards, level of the performance, etc, when compared with Europe, may result in more incidents reported per number of flights.3. EVAIR deals only with the ATM related incidents, while in the STEADES database there are incidents which are not only ATM related. This is especially noted in the area of Go-around for example. 4. In EVAIR multiple reports of the same event are correlated and counted once as a single incident, for example a single ACAS event reported to EVAIR by both airlines and the service provider involved in the incident is counted as one incident. STEADES, on the other hand, due to its de-identification practices, does not count the number of incidents, but rather counts the number of reports received. For example a single ACAS event reported by two airlines is counted in STEADES as two reports. However, it should be noted that the instances of more than one report being submitted for a single event in STEADES is considered to be low.

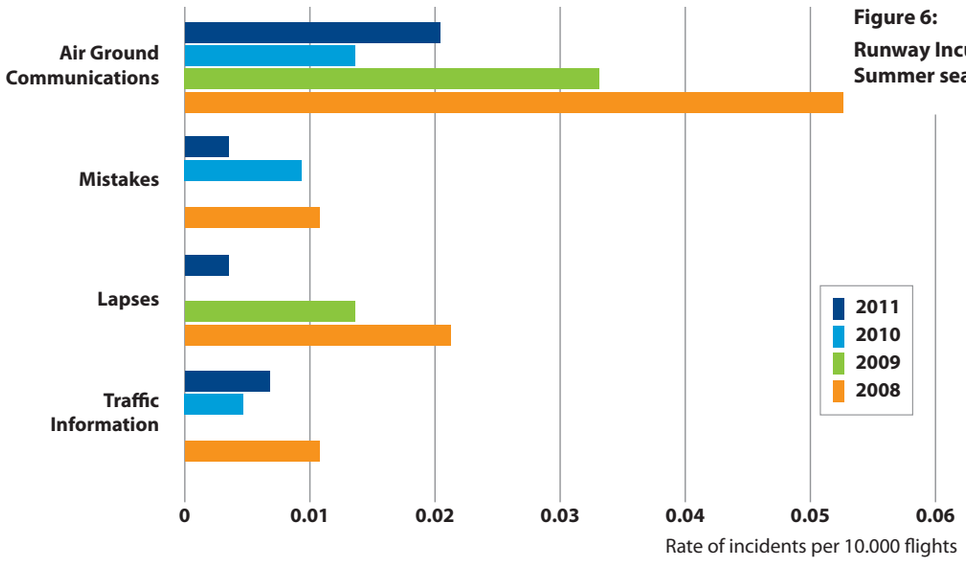


Figure 6:
Runway Incursions main contributors Summer seasons 2008 – 2011

A drill down through the EVAIR summer seasons 2008-2011 'Runway Incursions' data shows four various contributory factors ('Mistakes', 'Air-ground Communication', 'Traffic Information' and 'Lapses' - see figure 6). During summer 2011, all four of them were identified, while during the summer season 2010 'Lapses' were not identified. Compared with the other event types EVAIR monitors, the trends related to 'Runway incursion' contributors shows there was a drop only in the Mistakes' category whereas there were reductions across all contributing categories for the other types of event.

LEVEL BUST

In the EVAIR database during the summer 2011 the 'Level Bust' trend followed the general reductions recorded for that year. Although, in the summer 2011 in absolute figures there were more 'Level Bust' incidents than during the summer 2010, because there was a slight increase in the summer 2011 traffic within ECAC airspace, the relative figure is slightly lower than in the summer 2010. The general trend line in EVAIR databases shows a small decrease.

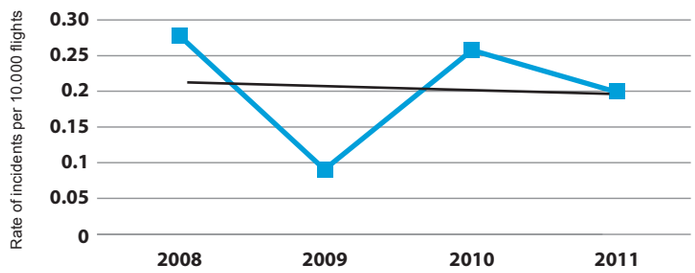


Figure 7:
Level Bust Summer seasons 2008-2011

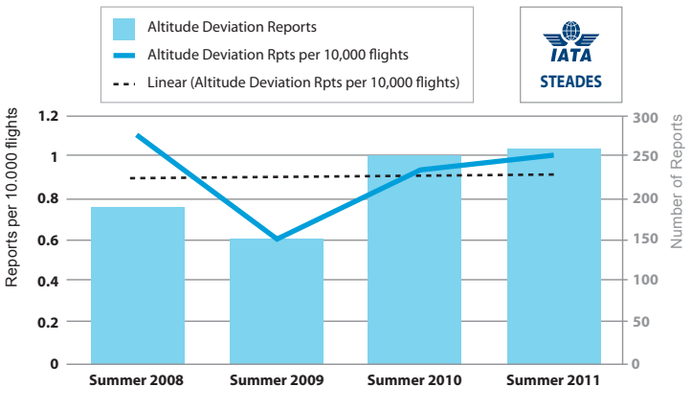


Figure 7a:
Altitude Deviation reports Summer seasons 2008-2011

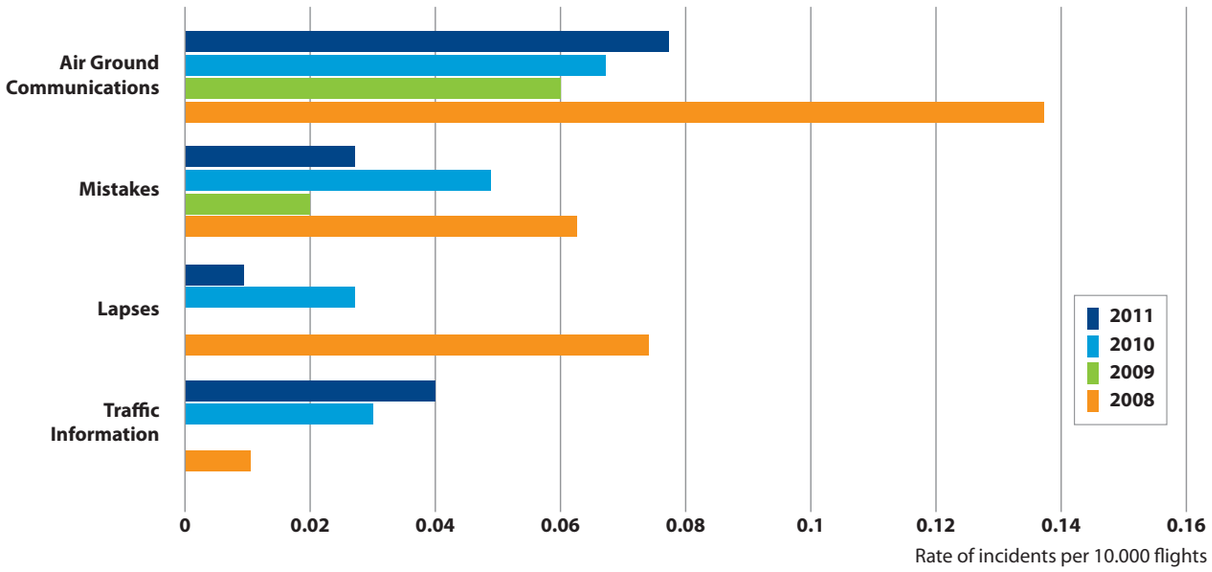


Figure 8:
Level Bust contributors summer seasons 2008-2011

During the summer 2011 two out of four contributors recorded an increase. 'Air-ground communication', which in general has the highest rate comparing it with the other contributors, increased by 21%, while 'Traffic information' increased by 28.4%. At the same time, 'Mistakes' decreased by 45% and 'Lapses' by 62%. Further mitigations to reduce the number of 'Level Busts' could centre on the 'Air-Ground communication' contributors. In particular, there should be a focus on 'Operational communication', which encompasses hear-back, read-back, standard phraseology, message construction etc. Within the manual incident reporting traditionally the largest number of ''Level Bust' reports occur within the En-route phase, while within the automated data collection, it is within the Approach phase of the flight.

SECTION 2 - EVAIR SUPPORT TO CALL SIGN SIMILARITY IMPLEMENTATION PROJECT

Previous EVAIR Safety Bulletins have featured the monitoring activity involving the EUROCONTROL Callsign Similarity (CSS) Project. This project aims to reduce the incidence of Callsign Similarity/Confusion by establishing pan-European CSS solutions centred on a coordinated Callsign Similarity Service and Tool provided by the Callsign Management Cell (CSMC) established in EUROCONTROL's Directorate Network Management (formerly CFMU).

Callsign Similarity Tool Development and testing of the EUROCONTROL Callsign Similarity Tool (CSS Tool) is ongoing; a growing number of aircraft operators are taking an interest. Indeed, two airlines used the Tool to de-conflict their Winter Season 2011-12 schedules and the results so far have been impressive with virtually no reports of 'single AO' similarities (i.e. a similarity involving two aircraft from the same company) recorded for these two airlines.

The intention is that in March 2012 the CSS Tool will be made available to all aircraft operators via the Network Manager NOP Portal (https://www.public.cfmu.eurocontrol.int/PUBPORTAL/gateway/spec/index.html). This will signal the formal start of Service Level 1 operations. For more information about how to access and use the tool please contact the CSMC at cfmu.csmc@eurocontrol.int.

Note: CSS Service Level 1 is the detection and de-confliction of Callsign Similarities within a single aircraft operator's schedule.

Thereafter, a second, fully-automatic version of the Tool is planned to be released for testing in Autumn 2012. In the interim, the manual and semi-manual first version of the Tool will still offer AOs a useful and credible means to de-conflict their flight schedules.

CALLSIGN CONFUSION SUMMER SEASON 2008-2011

As the CSS Project progresses, it will be necessary to monitor the effectiveness of the CSS Tool by those aircraft operators using it in 'live' operations. Some aircraft operators and ANSPs are already submitting regular Callsign similarity data and efforts will be made to encourage others to do the same.

It has been agreed that the existing EVAIR communications channels should be used for the transmission of Callsign Similarity/Confusion reports to EUROCONTROL.
Namely, as with other air safety reports, these can be sent to mailbox, Dragica.stankovic@eurocontrol.int .

For those AOs and ANSPs who are already submitting CSS data to EVAIR, we thank you. For those of you who are not, there is an open invitation to begin sending us such data now.

Important Reporting Note: It is requested that ALL reports sent to EVAIR use the ATC Callsign or operational Flight Identification rather than the Commercial Flight Number (CFN) (unless they are the same) as this helps the EVAIR staff process the data more easily and efficiently.

LEARN MORE ABOUT CALLSIGN SIMILARITY

If you are interested in learning more about the CSS Project then please contact the CSS Project Manager and co-chair of the CSS User Group, Mr Richard Lawrence, at:
richard.lawrence@eurocontrol.int or via
callsign.similarity@eurocontrol.int

The latest data reported to EVAIR and the comparison with IATA STEADES data is shown on the next page.

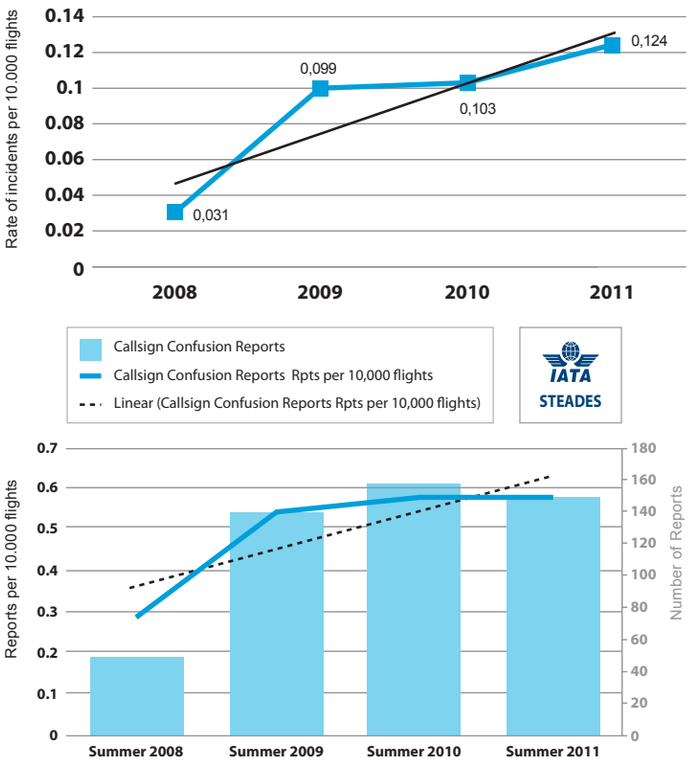


Figure 9:
Callsign Confusion
Summer seasons 2008-2011

Figure 9a:
Callsign Confusion
Summer seasons 2008-2011

Both the EVAIR and IATA STEADES global 'Callsign confusion' trends increased through summers 2008-2011. One of the reasons behind could be increased awareness of the European airlines that are part of the CSS project. In addition, a few European ANSPs have started providing regularly 'Callsign Similarity/Confusion' data. Airlines and ANSPs recognise the benefits of identifying CSS problems and correcting them quickly. Using the established EVAIR feedback mechanism, individual airlines have made amendments to their own schedules and airlines have also been put in contact with each other to resolve reported similarities. These actions are actively reducing the risk of 'Callsign confusion' incidents.

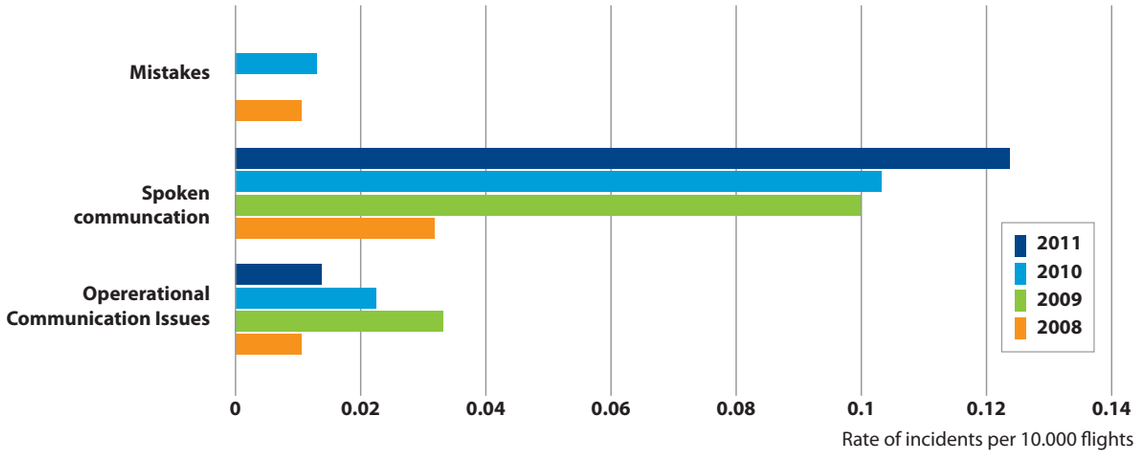


Figure 10:
Call Sign Confusion ATM Contributors Summer seasons 2008 – 2011

Out of three identified contributors only 'Spoken Communication', which is part of the 'Air-Ground communication', recorded an increase of 20.5% more reports. 'Operational communication' also part of the Air-Ground communication reduced by 40% during the summer 2011 vs same period in 2010. It is interesting to highlight that in the last three years, 'Operational communication' has reduced consistently. Finally, 'Mistakes' did not appear as a contributor in 2011.

SECTION 3 - AIR-GROUND COMMUNICATION

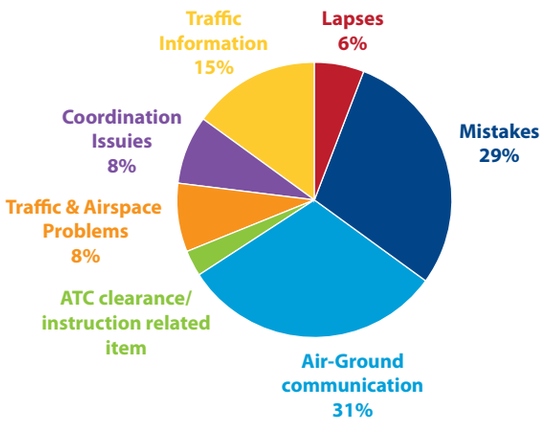


Figure 11:
Contributors to ATM Incidents cumulative figures Summer seasons 2006 - 2011

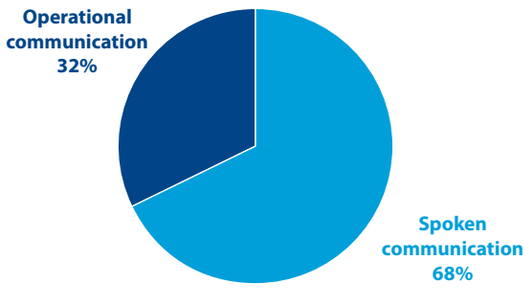


Figure 11a:
Air-Ground communication cumulative figures Summer seasons 2006 - 2011

'Air–ground communication' according to the HEIDI taxonomy consists of two big areas: 'Spoken' and 'Operational communication'. In this Safety Bulletin we are presenting the situation on the 'Air-ground communication' field for the summer seasons 2006 – 2011. Figure 11 shows that among the seven highest contributors, 'Air-ground communication' recorded the highest percentage (32%). It contributes to a large number of different types of events. We are listing those which are presented in EVAIR Safety Bulletins (RWY Incursion, Level Bust, Call Sign Similarity/Confusion, ACAS TCAS RAs, Missed approach/Go-around). The figure 11a shows that in the area of 'Air-ground communication', 'Spoken communication' with 68% is more than twice the size of 'Operational communication', which is 32%. 'Spoken communication' covers human/human communication encompassing air-ground and ground-ground communications but also call sign confusion, noise interference and other spoken information provided in plain language. Spoken air-ground communication refers also to 'language/accent', 'situation not conveyed by pilots', 'pilot's breach of radio telephony (R/T)', 'workload', 'misunderstanding/misinterpretation', and 'other pilot problems'. Ground-ground communication refers to 'misunderstanding/misinterpretation', 'poor/no coordination'.

The large presence of 'Air-Ground communication' as a contributory factor in a lot of different types of events leads us to propose that more attention should be given to Air Traffic Controllers' and pilots' training.

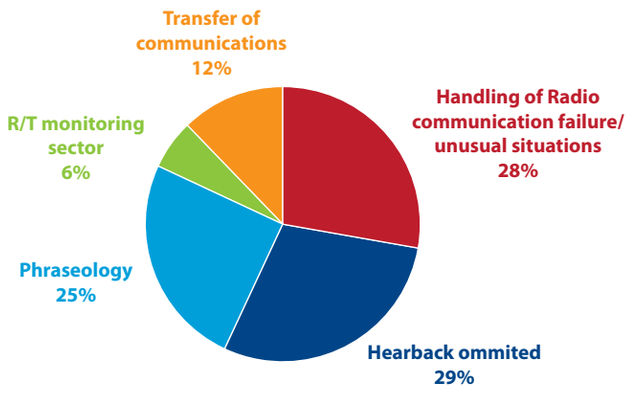


Figure 12:
Operational communication
Summer seasons 2006-2011

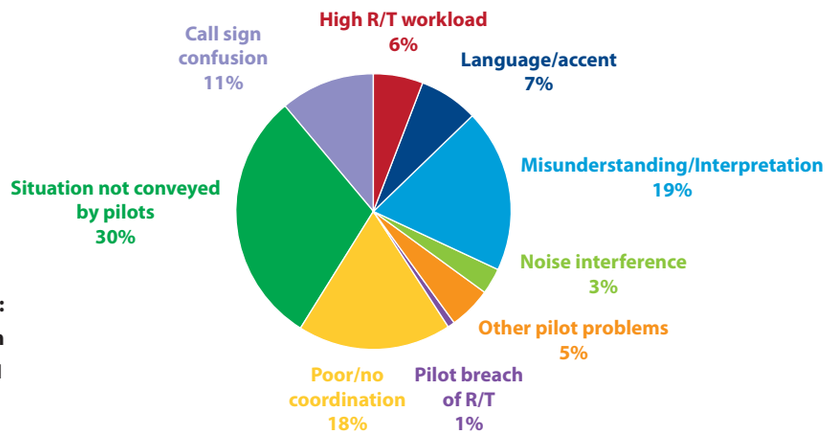


Figure 12a:
Spoken communication
Summer seasons 2006-2011

The most frequent Air-ground communication problems are shown in Figures 12 and 12a. Within 'Spoken', 9 different contributors have been identified. 'Situation not conveyed by pilots' has the highest trend - 31%. A further drill through the 'Situation not conveyed by pilots' contributor shows that use of two languages (i.e. English and a national language) on the operational frequency contributes to a lack of situational awareness. This leads to the conclusion that for the mitigation of this problem within international airspace and at international airports there should be the agreement to have only one language used on the operational frequency. Within EUROCONTROL the first steps have been taken to look at this issue in earnest and the discussion related to the use of only English language within international airspace and international airports is ongoing. We hope that for the next issue of the EVAIR Safety Bulletin we will be able to provide some positive results.

Regarding 'Operational Communication', among the five identified contributors three of them have a very similar percentage: Hear-back omitted - 29%; Handling of radio communication Failure/unusual situations 28%; and Phraseology 25%. As for the majority of the issues identified in the EVAIR data base, for 'Operational communication', we also see training of pilots and controllers as one of the potential remedies.

SECTION 4 - SPECIFIC EVENTS
LASERS THREATS WIDESPREAD ACROSS EUROPE

Prompted by stakeholders and the collected laser incidents which showed the growing menace to aviation caused by the misuse of hand-held laser devices, EUROCONTROL hosted a seminar on laser interference in aviation on 10 - 11 October 2011. Some 160 representatives from a variety of sectors in the aviation field, regulatory, law enforcement and research institutions attended. The seminar was organised together with the European Commission, ICAO, the European Cockpit Association, IFALPA, IATA and the Association of European Airlines.

Participants at the seminar agreed that timely and effective in-flight and post-flight procedures for dealing with interference are needed - as well as training in these procedures for both pilots and air traffic controllers. Alerting processes to the authorities have to be defined and awareness campaigns run. Guidance material for decision-making is also required. It was also felt that advances in nanotechnology filters might prove helpful in the future.

At present, only a handful of European states have State regulations on laser interference and the seminar felt that judicial measures should be taken further. The seminar concluded by calling on the European Union to develop stringent regulation on the production, distribution, purchase, carriage and use of lasers. It is noteworthy that in some European states laser perpetrators have been arrested and prosecuted.

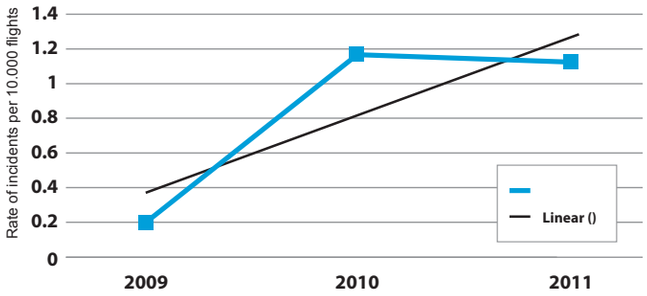


Figure 13:
Laser Summer seasons 2008-2011

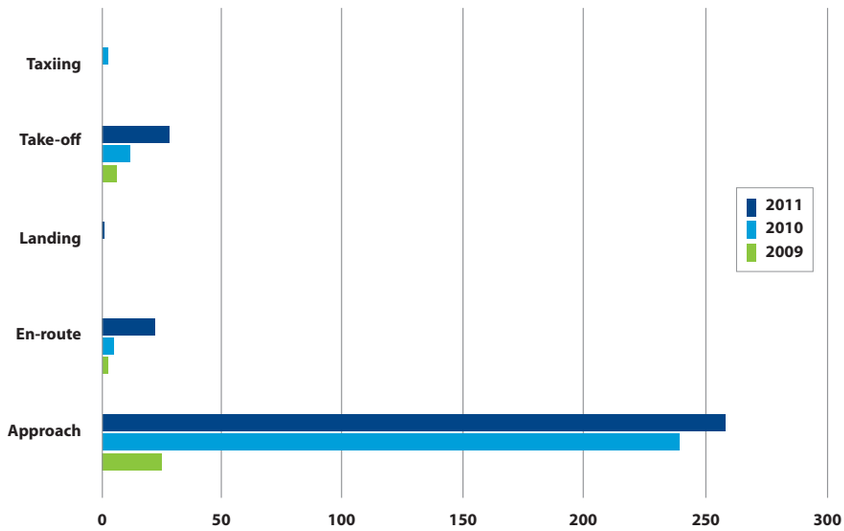


Figure 13a:
Laser occurrences per phase of fight

The summer 2011 data shows a slight decrease in the number of reported laser interferences. Unsurprisingly, 'Approach' is still the most affected phase of flight by laser. EVAIR will continues to monitor laser interference data collection since we just started the actions towards the legal and in-flight and post-flight procedural solutions. As for other type of the ATM Incidents please send reports to: Dragica.stankovic@eurocontrol.int

Further information about lasers and aviation is available on SKYbrary (www.skybrary.aero).

SECTION 5 - ACAS REPORTING

EVAIR ACAS monitoring aims to ensure the continued safe and effective operation of ACAS by identifying and measuring issues associated with RAs and their trends and taking preventive measures where necessary.

ACAS is the generic term for Airborne Collision Avoidance Systems, of which TCAS II is the only example of implementation so far. ACAS is intended to improve air safety by acting as a 'last-resort' method of preventing mid-air collisions or near collisions between aircraft. Although ACAS II implementation was completed in 2005, ACAS monitoring continues to improve safety by identifying technical and procedural deficiencies.

ACAS data have been collected either automatically via the Automated Safety Monitoring Tool (ASMT) developed by EUROCONTROL, or manually thanks to airlines and ANSPs reporting.

It should be noted that ACAS / TCAS statistics from manual reporting rely on pilots' and controllers' perceptions and memories of the events rather than measured or calculated values. Therefore care is needed when comparing manually collected data and data that are captured automatically. Messages about typical performance should generally be taken from the Automatic recording of events. Manual reporting tends to give emphasis to more significant events and insights into perception of the ACAS II system.

It is important to highlight that until 2009 EVAIR was receiving automatic ACAS RA data from only one radar station. For this Safety Bulletin we prepared the data collected automatically from 13 radar stations, which belong to two Air Navigation Service Providers. From these 13 radars a total of 3363 events with valid RAs were recorded. Among them there were 49 complex events, which is almost 46.5% fewer than during the summer 2010 when there were 91 complex events. Further monitoring will show if this decreasing trend continues.

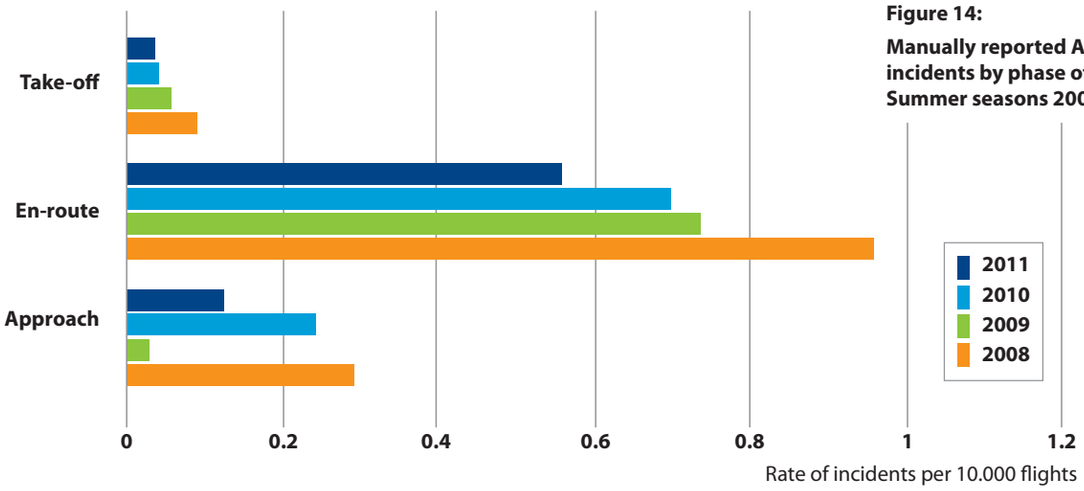


Figure 14:
Manually reported ACAS incidents by phase of flights Summer seasons 2008 – 2011

The decrease of recorded RAs during the summer 2010 continued in 2011. All phases of flight showed a reduction. Interestingly still within the manual reporting, the highest number of RAs was recorded within En-route airspace, which contrasts with the data collected automatically, which shows that the highest number of RAs occur within TMAs.

ICAO ADREP definitions of types of RAs are shown below.

- **Useful RA** - The ACAS II system generated an advisory in accordance with its technical specifications in a situation where there was or would have been a risk of collision between the aircraft.
- **Unnecessary (Nuisance) RA** - The ACAS II system generated an advisory in accordance with its technical specification in a situation where there was not, or would have not been, a risk of collision between the aircraft.
- **Unclassifiable RA** - The ACAS II system generated an advisory that cannot be classified because of insufficient data.

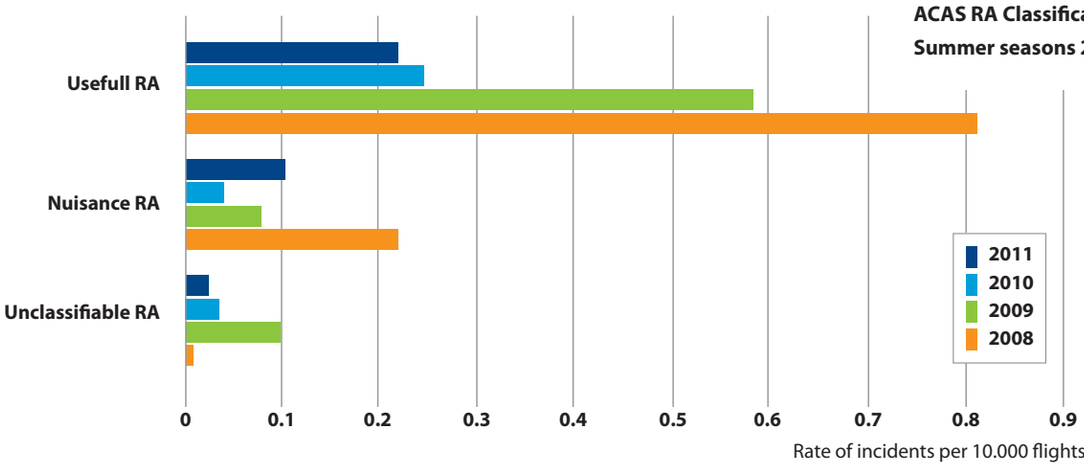


Figure 15:
ACAS RA Classification Summer seasons 2008 - 2011

The decrease of recorded RAs during the summer 2010 continued in 2011. All phases of flight, showed a reduction. Interestingly still within the manual reporting, the highest number of RAs was recorded within En-route airspace, which contrasts with the data collected automatically, which shows that the highest number of RAs occur within TMAs.

RA INSTRUCTIONS SUMMER SEASONS 2008-2011

All types of ACAS RA instructions recorded a decrease. Some of them such as 'Monitor Vertical Speed' decreased by 59%, while some of them like 'Reduce/Adjust RA' decreased by only 0.8%. It would be good to see the latter type of RA reduce because it is the type of the RA instruction with the highest trend through summer periods 2008-2011.

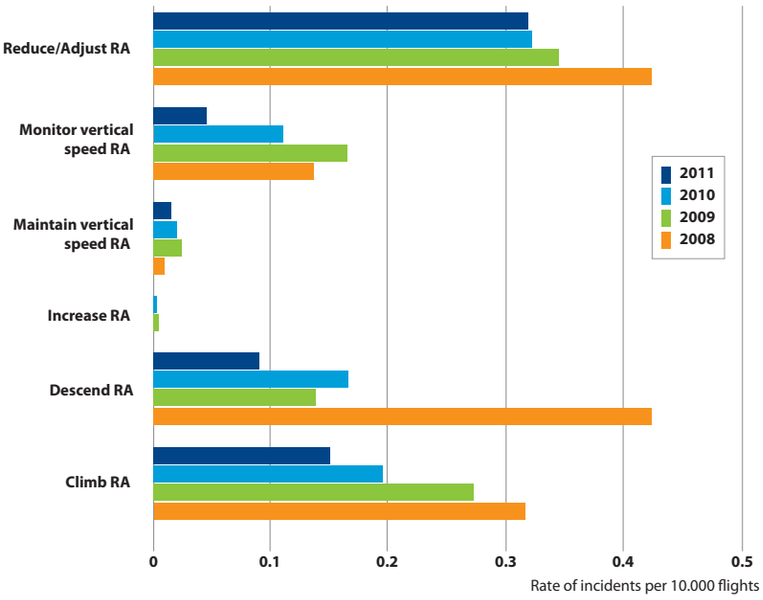


Figure 16:
ACAS RA Instructions
Summer seasons 2008-2011

ACAS FL DISTRIBUTION

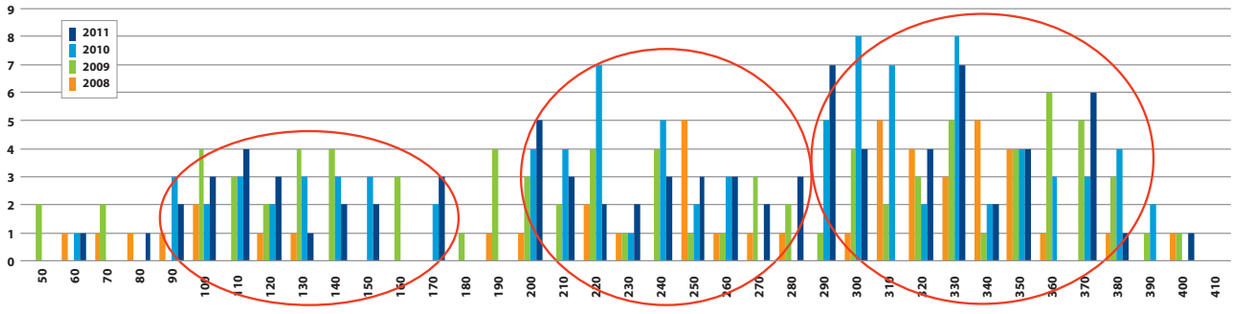


Figure 17: ACAS Flight Level Distribution
Summer seasons 2008-2011absolute figures

Statistics related to the FL distribution of the manually collected ACAS incidents show that the ACAS incidents are located in clusters of FLs. For the summer periods 2008 – 2011 (in absolute figures) the ACAS RAs are grouped in 3 big areas. FLs between 90 -170, 200 – 280 and 290-370. Some FLs like FL110, FL120, FL170, FL200, FL230, FL250, FL280, FL320 and FL370 had an increase of the number of incidents.

PART TWO - ACAS RAs COLLECTED AUTOMATICALLY FROM MODE S RADAR STATION

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Analysis of Automatically provided ACAS RAs
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Garfield Dean
ACAS Expert
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The Automated Safety Monitoring Tool (ASMT) is being used to record and analyze all ACAS advisory messages down linked by a number of Mode S radars in European airspace. This set of statistics has been assembled from data collected during 2009-2011

AVAILABILITY OF DATA

During 2009 automatic monitoring was transferred from monitoring one radar on line (in busy airspace) to processing recorded radar LAN data from 10 radars. In 2010 two more radars were added. And in 2011 data for one more radar became available. EVAIR now monitors RA downlink data from 13 radars from two ANSPs. However data from all 13 radars have not been continuous and variations of numbers per year can not be usefully compared; however percentages provide an indication of performance.

NUMBER OF EVENTS RECORDED

In 2011 recorded data was processed from 13 radars over the summer period months. A total of 3363 events were recorded with most of the events captured by multiple radars, from a total of 17290 RA downlink triggered recordings.

Year	Events with valid RA	Events with Erroneous RA messages	Complex RA events	Totals
2010	4272	7015	91	12146
2011	3363	13162	49	17290

The increase in recorded events identified as erroneous is due to an additional set of aircraft from one of the EUROCONTROL members exhibiting the problem of falsely indicating the presence of an RA.

DATA FROM SINGLE RADAR

To provide comparison over 3 years data has been taken from a single Radar between March-September for each year.

Year	Events with valid RA	Events with Erroneous RA messages	Complex RA events	Totals
2011	504	1738	4	2247
2010	598	935	8	1541
2009	668	3032	19	3719

In Events with valid RA messages = RA downlink messages which are not empty or do not contain only the stop bit.
Events with erroneous RA messages = RA downlink messages which are empty or contain only a stop bit.
Complex RA events = Events where more than two different RA alerts are generated for one aircraft during the encounter.
The figures show a significant drop in the number of valid RAs over the three summer periods .

DOWNLINK ANOMALIES

In 2011 the number of Erroneous messages increased to 13262 of which 10656 were from 41 Airframes, it was noted that 43% still come from 14 Airframes that had previously been identified

In summary, a small number of aircraft are non-compliant with the SARPS and 'pollute' the RF environment. Further corrective action is needed with the operators concerned.

RA DISTRIBUTION BY FLIGHT LEVELS

Figure 21 shows the number of RAs by Flight Level for each of the years 2009 – 2011. All recorded RAs with a valid downlink message (not blank and not stop only) have been counted even if the intruding aircraft has not been identified. FL in this report are rounded to the nearest FL (e.g. FL113 = FL110). **There are a large proportion of RAs between FL10 and 30. They are mostly the result of VFR traffic in uncontrolled airspace**. (Figure 18 below shows the high number of Mode C Intruders at these levels, but note at lower flight levels the increased proportion of Mode S equipped intruders over time, suggests a greater proportion of GA aircraft are now fitted with Mode S transponders).

INTRUDER EQUIPAGE BY FLIGHT BANDS.

Figure 18 below shows the number of events recorded with RAs on both aircraft and the number of events where only one aircraft reported an RA. Events shown as an RA with a Mode S intruder are frequently ACAS equipped. ACAS does not symmetrically generate RAs. There are many events where only one aircraft receives an RA, even though both are ACAS equipped. Both Mode S and Mode C intruders are identified by the Own RA downlink message. Between 2008 and 2010 in the lower levels there was an increased percentage of aircraft identified as Mode S intruders and a reduction in Mode C intruders which may be due the increase in the number of General Aviation aircraft fitting Mode S transponders. This is more significant in 2010 than 2009. However the trend in 2011 appears to be a general overall reduction across all levels in both Mode C and Mode S but the ratio in the lower levels still shows and increase in Mode S equipped intruders, as can be seen in Fig 18.

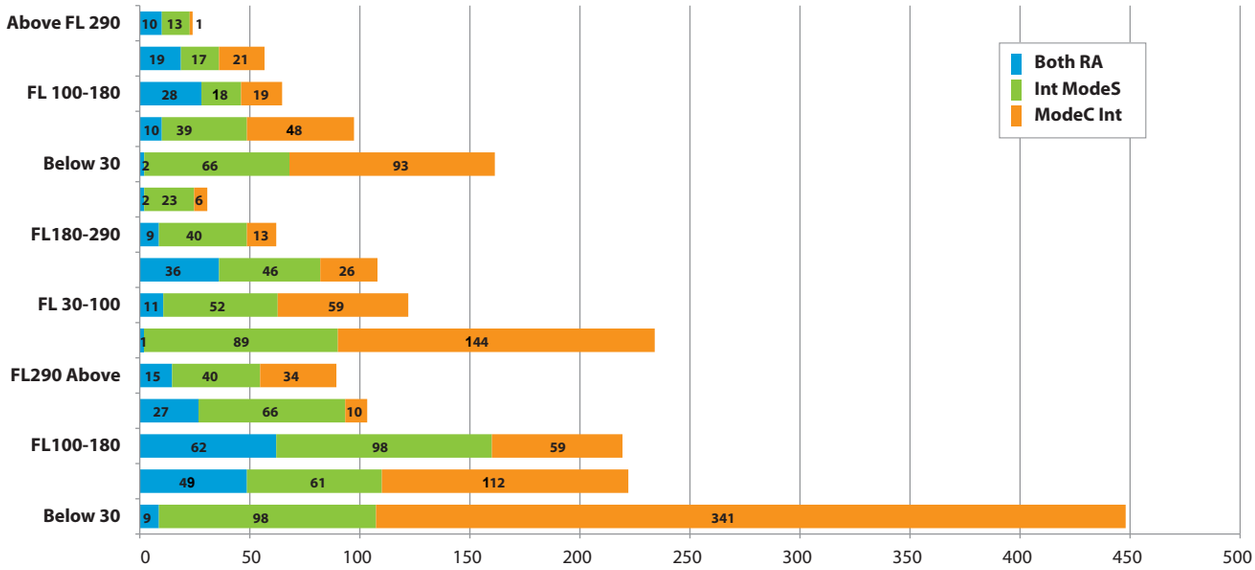


Figure 18:
ACAS equipage in Encounters

Note: The number of events at each level is lower than the number of RAs because more than one RA can exist for each event.

At lower flight levels, the majority of RAs were against Mode C intruders, whereas at higher levels, most RAs were against intruders with Mode S or are coordinated ACAS encounters.

HOT SPOTS

Plotting XY distributions of RAs at different altitude ranges allows "RA hotspots" to be identified.

Frequently these are related to airspace design and airspace classification issues, e.g. where climbing aircraft level off just below a flight level where descending aircraft level off too. An example hot spot diagram is shown below. Better conclusions can be drawn when the route network is also shown.

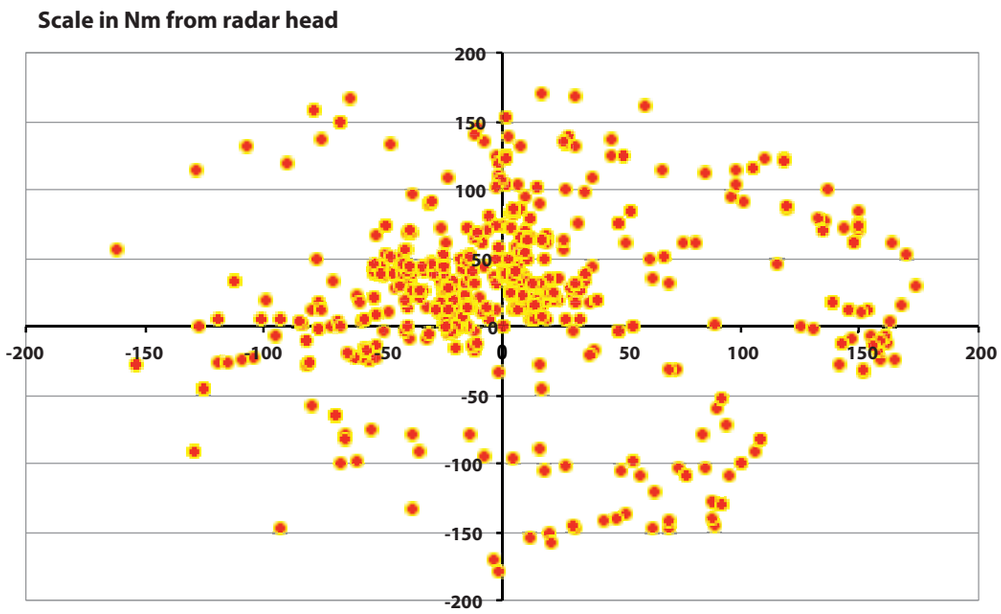
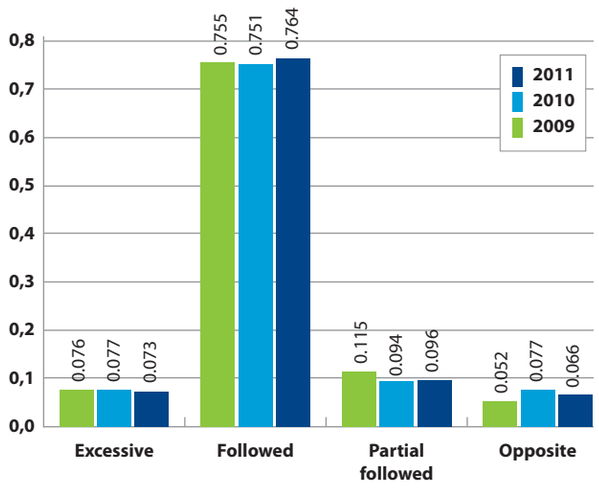


Figure 19:
Example of Hot Spot Diagram using Summer 2011 data

PILOT RESPONSE

For an RA that does not change for at least 2 radar cycles, i.e. 10 seconds (417 events in 2011- 67%), we see that there were 75% achieving the requested vertical rate, 8% exceeding the requested rate and 12% either slow or failing to achieve the requested rate. However 5% were calculated to give opposite responses and by observation most of these incidents involved only military aircraft. 2011 shows a reduction in opposite response

Year	Excessive	Followed	Partial followed	Opposite
2011	8%	76%	12%	5%
2010	8%	75%	9%	8%
2009	7%	76%	10%	7%

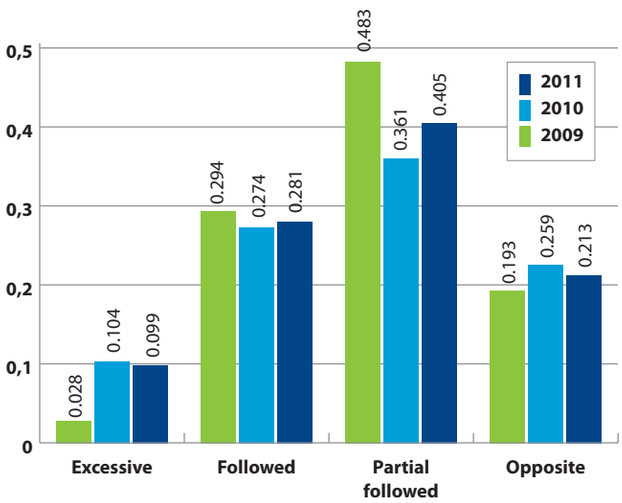


STANDARD

Figure 20:
20 Response to RAs

For changing RAs (207 events in 2011 – 33%), where the RA is observed to change after one radar cycle (changes in less than 10 seconds), compliance with the RA is not as good, even though ACAS expects a quicker response from pilots. The method of calculating response in these cases could lead to underestimating the response. Although some improvement has been observed, t**he high level of opposite responses to changing RAs is a cause for concern and re-emphasizes the need for pilots to be trained to follow the full sequence of RAs that they receive.**

Year	Excessive	Followed	Partial followed	Opposite
2011	21%	28%	41%	21%
2010	10%	27%	36%	26%
2009	3%	29%	48%	19%



SHORT

Figure 21:
Response to changing RAs

VERTICAL RATES AT THE TIME OF THE RA

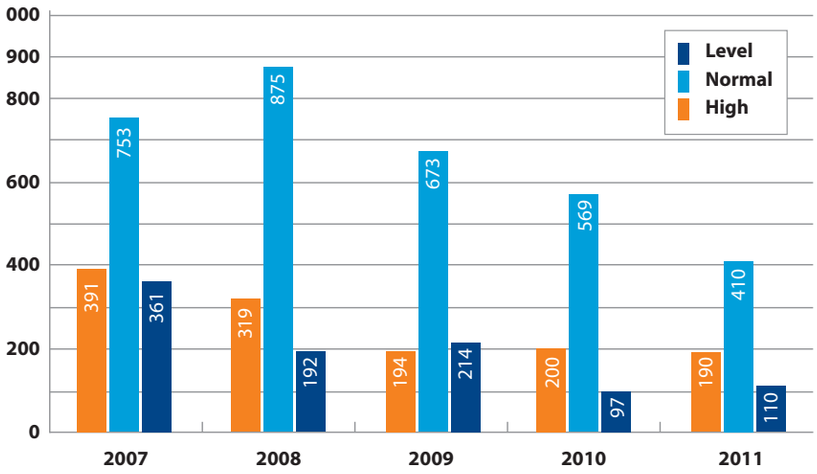


Figure 22

At the time of the first RA reports analysis evaluation shows 58% of aircraft had a vertical rate below 1500fpm which is a reduction from what had been a steady increase over the four previous years indicating the message is being forgotten. In addition there has been an increase in the percentage of Own aircraft with High vertical rate in last two years.

	2007	2008	2009	2010	2011
High	26%	23%	18%	24%	27%
Normal	50%	63%	62%	66%	58%
Level	24%	14%	20%	11%	15%

Pilots should be aware of the following provision in PANS-OPS that is in force from 20th November 2008:

"Pilots should use appropriate procedures by which an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, may do so at a rate less than 8 m/s (or 1 500 ft/min) throughout the last 300 m (or 1 000 ft) of climb or descent to the assigned altitude or flight level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level, unless otherwise instructed by ATC. These procedures are intended to avoid unnecessary airborne collision avoidance system (ACAS II) resolution advisories in aircraft at or approaching adjacent altitudes or flight levels. For commercial operations, these procedures should be specified by the operator."

It is hypothesised that the reduction in Climb and Descend RA numbers may be partially attributed to greater awareness of the above provision.

ADVISORIES ISSUED

The number of RAs is greater than the number of events for two reasons: more than one RA can be issued to an aircraft during an event; and both own aircraft and intruder can issue an RA. The table below shows the breakdown of advisories issued in the collected data.

The increase in the number and percentage of AVSA RAs may be due to the recommendation to reduce vertical rate below 1500fpm in the last 1000ft when approaching a cleared level.

Code	Advisory	2009	2010	2011
AVS	Adjust Vertical Speed	34.00%	38.02%	48,70%
MVS	Monitor Vertical Speed	24.00%	20.93%	19,97%
CL	Climb	22.00%	21.05%	18,83%
DE	Descent	12.40%	13.26%	9,74%
KVS	Maintain Vertical Speed	2.00%	1.51%	0,65%
ICL	Increase Climb	2.40%	0.47%	0,32%
ICD	Increase Decent	1.40%	0.47%	0,49%
RCL	Reversal Climb	0.50%	0.81%	0,16%
RDE	Reversal Descent	0.00%	1.28%	0,16%
CCL	Crossing Climb	0.00%	0.81%	0,65%
CDE	Crossing Descent	0.00%	1.40%	0,32%

The majority of ACAS advisories are AVS or MVS. They do not require deviation from ATC clearance unless ATC requests a specific vertical rate. In Summer 2011 they correspond to 69% of RAs compared with 59% in 2010 and 58% in 2009.

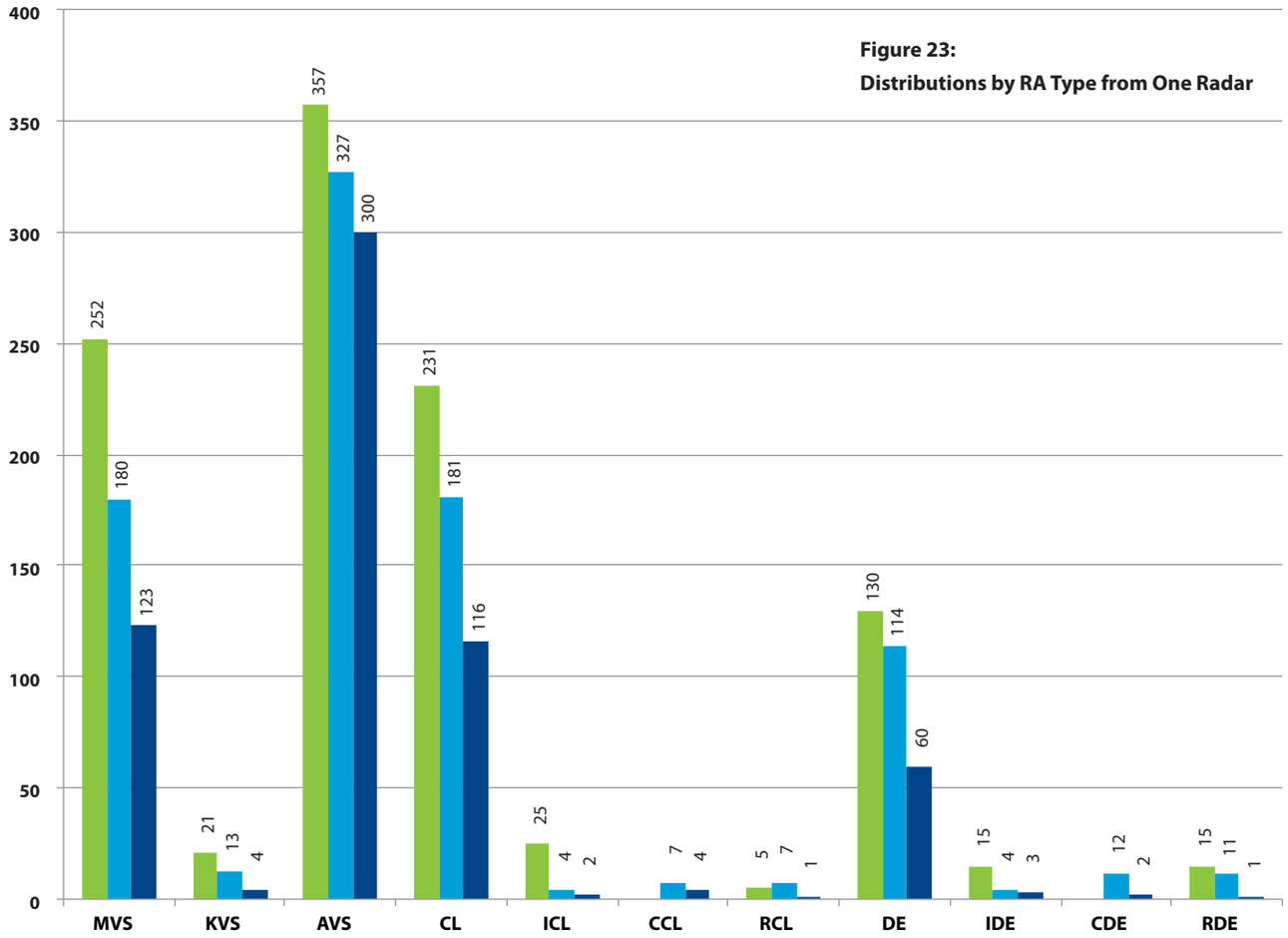


Figure 23:
Distributions by RA Type from One Radar

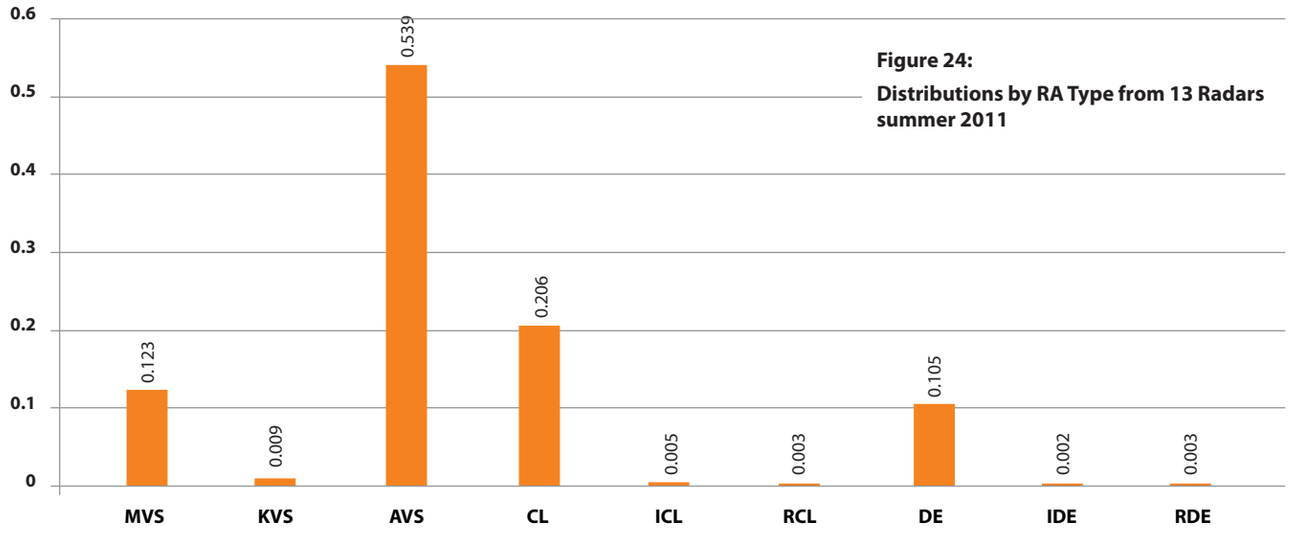


Figure 24:
Distributions by RA Type from 13 Radars summer 2011

TIMING DISTRIBUTION OF RA DOWNLINKS BEFORE CPA

		Downlink Time before CPA in Sec						
Sensitivity Level	Own Altitude	<5	5<10	10<15	15<20	20<25	25<30	>30
2	<1000ft	15	4		2	1	1	1
3	1000-2350ft	20	13	28	14	7	1	
4	2350-5000ft	14	13	10	9	12	2	11
5	5000-10000	9	2	6	2	3	5	8
6	10000-20000	12	10	2	7	3	10	18
7	20000-42000	14	12	3	4	4	6	31

ASMT calculated the time of closest approach (CPA) for 3259 Downlink RA Messages between March 2011 and September 2011. The timing of the first downlinked message from a Mode S radar was subtracted from CPA time for each event. The results are shown in the table above. The table gives an indication of the distribution of warning times prior to CPA that might be available from RA downlink using Mode S radar.

It should be noted that very few, if any, of these cases would correspond to very close encounters, and therefore the warning times shown here may differ from those that will occur in safety critical cases. Nevertheless, they should be representative of what would be most frequently observed in such a system.

Preview of the impact that TCAS V7.1 Advisory change may have.

With the mandate for TCAS version 7.1 being rolled out already, what can we expect to see with regard to TCAS encounters. The diagrams below show the difference between two versions the second simulation showing the Level Off level Off as opposed to monitor vertical speed shown in the first simulation.

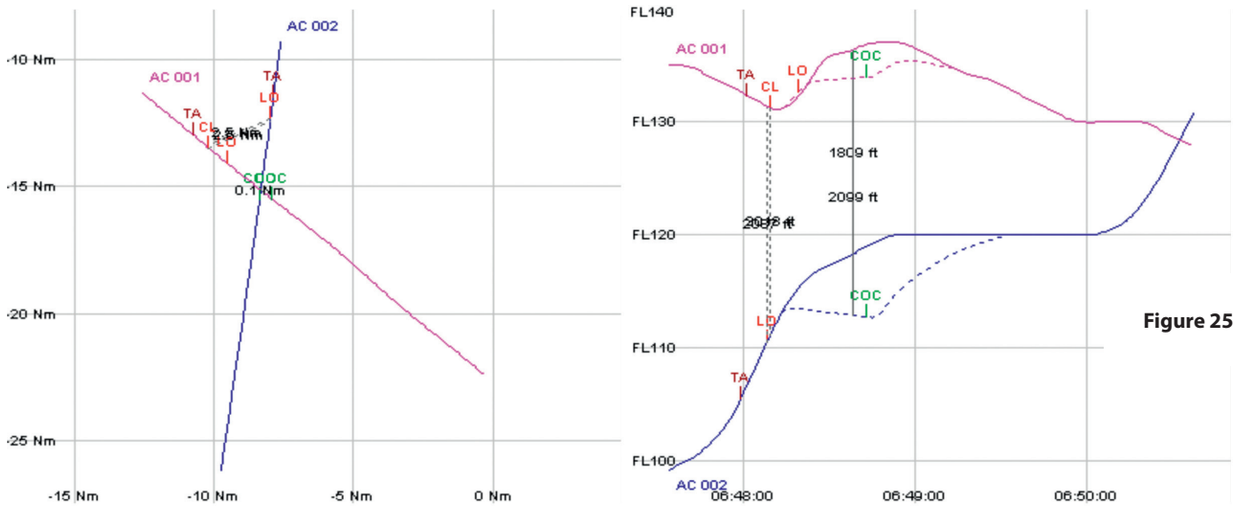


Figure 25

The first simulation shown here shows pilot response for AC 002 following the green arc with an advisory green arc 1500fpm to 2000fpm provided by version 7.0

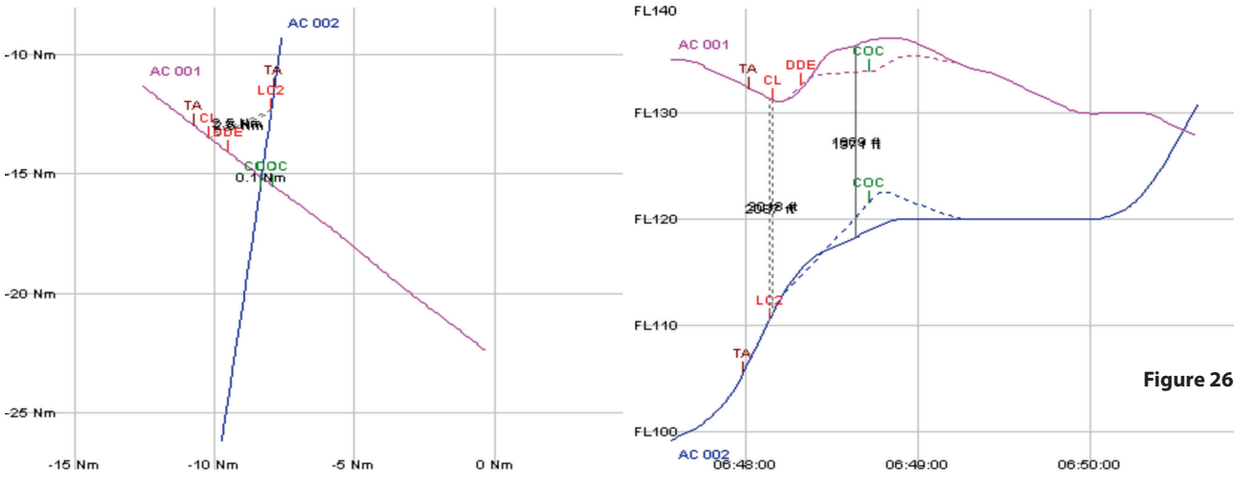


Figure 26

Simulation showing AC002 pilot response following the green arc -300fpm to 0fpm provided by TCAS Version 7.1[2]

2 More information about the version 7.1 can be found in the EUROCONTROL ACAS Bulletin no. 14
Visit us online: http://www.eurocontrol.int/msa/public/standard_page/ACAS_Startpage.html

ANNEX 1 – EUROPEAN ACTION PLANS

EUROPEAN ACTION PLAN FOR AIR-GROUND COMMUNICATIONS SAFETY

The Air-Ground Communication (AGC) Safety Improvement Initiative was launched by the EUROCONTROL Safety Team in 2004, and is addressing communications issues identified in the Runway Incursion and Level Bust Safety Improvement Initiatives as well as other issues of concern such as call sign confusion, undetected simultaneous transmissions, radio interference, use of standard phraseology, and prolonged loss of communication.

Communication between air traffic controllers and pilots remains a vital part of air traffic control operations, and communication problems can result in hazardous situations. A first step towards reducing the incidence of communication problems is to understand why and how they happen.The Action Plan is available on the ALLCLEAR Communication Toolkit http://skybrary.aero/index.php/Solutions:ALLCLEAR

THE EUROPEAN ACTION PLAN FOR THE PREVENTION OF LEVEL BUST

Reducing Level busts is one of EUROCONTROL's highest priorities. EUROCONTROL began raising awareness of the Level Bust issue in 2001, organised series of workshops, and established a Level Bust Task Force to define the recommendations and to formulate an action plan to reduce level busts.

The level bust action plan is the product of work carried out by EUROCONTROL's cross-industry Level Bust Task Force, which was set up in 2003. The Task Force reviewed the evidence available, identified the principal causal factors, and listened to the Air Navigation Service Providers and aircraft operators with experience in reducing level busts.

The Action Plan contains recommendations for Air Traffic Management, Air Traffic Controllers, and Aircraft Operators. It designed to reduce the frequency of level busts and reduce the risks associated with level busts. Implementation of the Action Plan will be monitored by the Task Force monitoring group reporting to the EUROCONTROL Safety Improvement Sub Group (SISG).

http://www.eurocontrol.int/safety/public/standard_page/Level_bust.html

THE EUROPEAN ACTION PLAN FOR THE PREVENTION OF RUNWAY INCURSIONS (EAPRI)

Although runway safety includes issues such as foreign objects, debris and wildlife straying onto the runway and other technical deficiencies, this action plan specifically addresses the subject of runway incursion prevention.

EAPRI is the result of the combined efforts of organisations representing all areas of aerodrome operations that are totally committed to enhancing the safety of runway operations by advocating the implementation of the recommendations that it contains in the ECAC area. The ICAO secretariat has lent its strong support to the work of this group and urges all States to fully implement the ICAO provisions relevant to runway safety.

The 56 recommendations, when implemented, will enhance runway safety by the consistent and harmonised application of existing ICAO provisions, improving **controller – pilot – vehicle driver communications** and working procedures at the aerodrome, and by the subsequent increase in **situational awareness**.

http://www.eurocontrol.int/runwaysafety/public/subsite_homepage/homepage.html

CALL SIGN SIMILARITY (CSS)

The European Action Plan for Air Ground Communication Safety (conceived inter alia by EUROCONTROL, aircraft operators (AOs) and the Flight Safety Foundation) identified call sign similarity (CSS) as a significant contributor to air-ground communication issues. Analysis of ATC reported events shows that 5% involve incidences where CSS is involved. Some aircraft operators are trying to find solutions, the only know ANSP actively operating a service to de-conflict call signs is France's DSNA.

Research and CBA studies show that the most cost efficient way of providing a long-lasting, Europe-wide solution is to create a central management service to de-conflict ATC call signs. This strategy provides economies of scale and rapid pay back of investment (3 years). More importantly, it is calculated that it will eliminate over 80% of the CSS incidences and thus improve safety.

http://www.eurocontrol.int/safety/public/standard_page/Callsign_Similarity_project.html

ANNEX 2 – DEFINITIONS

Following definitions are extracted from the HEIDI and/or HERA Taxonomies.

HEIDI (Harmonisation of European Incident Definitions Initiative for ATM)
intends to finalise a harmonised set of definitions (taxonomy) for ATM related occurrences.

HERA (Human Error in European Air Traffic Management) develops a detailed methodology for analysing human errors in ATM, including all error forms and their causal, contributory and compounding factors.

More information can be found at:
HEIDI: http://www.eurocontrol.int/src/public/standard_page/esarr2_heidi.html
HERA: http://www.eurocontrol.int/humanfactors/public/site_preferences/display_library_list_public.html#5

DEFINITIONS

ATC clearance/instruction (HEIDI): Related to incorrect or wrong aircraft action. Authorisation for an aircraft to proceed under conditions specified by an air traffic control unit and deviations from the clearance which cause runway incursions, taxiway incursions, apron incursions, level bust, unauthorised penetration of airspace etc.

Coordination (HEIDI): internal coordination encompassing coordination with sectors within the same unit, and sectors within the ATC suite; external coordination, civil/civil and civil/military; and special coordination, covering expedite clearance, prior permission required, revision and other special coordination.

Contributory factors (HEIDI): A part of the chain of events or combination of events which has played a role in the occurrence (either by easing its emergence or by aggravating the consequences thereof) but for which it cannot be determined whether its non existence would have changed the course of events.

Decision-Making (HERA): cover incorrect, late or absence of decision

Failure to Monitor (HERA): failure to monitor people, information or automation

Judgement (HERA): mainly associated to separation

Lapses (HEIDI): psychological issues encompassing: Reception of information, Identification of information, Perception of information, Detection, Misunderstanding, Monitoring, Timing, Distraction, Forgetting and Loss of awareness.

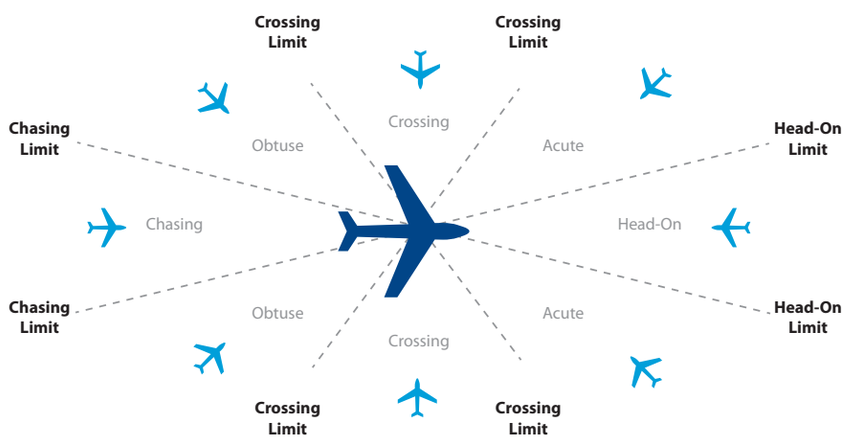
Level bust (HEIDI): Any unauthorised vertical deviation of more than 300 feet from an ATC flight clearance Departing from a previously maintained FL, overshooting, undershooting, levelling-off at a different level than cleared level.

Mental/Emotional/Personality issues (HERA): include the following items

- Mental capacity: loss of picture or Safety Awareness
- Confidence in self, in others, in information, in equipment, in automation
- Complacency
- Motivation/Morale
- Attitudes to others
- Personality traits: aggressive, assertive, under-confident, risk taking
- Emotional status: stressed, post incident
- Miss-stored or insufficient learned information
- Planning: insufficient, incorrect or failed
- Recall of information: ailed, inaccurate, rare information, past information
- Violations: routine, exceptional

Mistakes (HEIDI): psychological issues encompassing: Information wrongly associated, Workload issues, Information not detected, Failure to monitor, Recall of information, Misunderstanding or insufficiently learned information, Judgement, Planning, Decision making, Assumptions and Mindset.

Operational communication (HEIDI): Air-Ground, Ground-Ground and Use of equipment verification testing. Air-Ground communication encompasses hear back omitted, pilots' read back, standard phraseology, message construction, R/T monitoring including sector frequency monitoring and emergency frequency monitoring, handling of radio communication failure, unlawful radio communications transmission. Ground-Ground communication refers to the standard phraseology, speech techniques, message construction, standard use of equipment like, radio frequency, telephones, intercoms etc.



Runway Incursion (ICAO): Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft.

Spoken communication (HEIDI): human/human communication encompassing air-ground and ground-ground communications but also call sign confusion, noise interference and other spoken information provided in plain language. Air-ground communication refers to language/accent, situation not conveyed by pilots, pilot's breach of radio telephony (R/T), workload, misunderstanding/misinterpretation, and other pilot problems. Ground-ground communication refers to misunderstanding/misinterpretation, poor/no coordination.

Taxiway Incursion (HEIDI): Any occurrence unauthorized presence on a taxiway of an aircraft, vehicle, person or object that creates a collision hazard or results in a potential loss of separation

Traffic & Airspace problems (HEIDI): there are four set of causal factors under this element

- Traffic load & complexity, encompassing excessive and fluctuating load, unexpected traffic demand, complex mix of traffic, unusual situations (emergency, high risk, other), Abnormal time pressure, underload and call signs confusion.
- Airspace problems composed of flights in non controlled and controlled air space, Airspace design characteristics(complexity, changes, other) and temporary sector activities(military, parachuting, volcanic activity, training)
- Weather problems such as poor or unpredictable(snow, slush, ice, fog, law cloud, thunderstorm, wind shear)
- Pilot problems concerning language, culture and experience aspects.

Traffic Information (HEIDI): essential and local traffic information provided by an air traffic controller to the pilot. Essential information is related to the provision of traffic information containing:

a) direction of flight of aircraft concerned;
b) type and wake turbulence category (if relevant) of aircraft concerned;
c) cruising level of aircraft concerned; and
d) estimated time over the reporting point nearest to where the level will be crossed; or
e) relative bearing of the aircraft concerned in terms of the 12-hour clock as well as distance from the conflicting traffic; or
f) actual or estimated position of the aircraft concerned.

Local traffic in this context consists of any aircraft, vehicle or personnel on or near the runway to be used, or traffic in the take-off and climb-out area or the final approach area, which may constitute a collision hazard to the other aircraft and about which the information has to be provided.

Workload issues (HERA): concern both minimal and excessive workload

ANNEX 3 ACRONYMS

ACAS	Airborne Collision Avoidance System
ANSP	Air Navigation Services Provider
AO	Aircraft Operator
ASMT	ATM Safety Monitoring Tool
ATC	Air Traffic Control
ATM/CNS	Air Traffic Management/Communication, Navigation, Surveillance
CFMU	Central Flow Management Unit
CSS	Call Sign Similarity
ECAC	European Civil Aviation Conference
EVAIR	EUROCONTROL Voluntary ATM Incidents Reporting
FL	Flight Level
GAT	General Air Traffic
HEIDI	Harmonisation of European Incident Definitions Initiative for ATM
HERA	Human Error in European Air Traffic Management
LAN	Local Area Network
Mode C	Altitude Reporting Mode of Secondary Radar (ICAO)
Mode S	SSR selective mode of interrogation
NATS	National Air Traffic Services (UK)
OPS	Operations
PAN-OPS	Procedures for Air Navigation - Operations
RA	Resolution Advisory
RF	Radio Frequency
RWY	Runway
SARPS	Standard And Recommended Practices
SISG	Safety Improvement Sub-Group
SSR	Secondary Surveillance Radar
TCAS	Traffic Collision Avoidance Systemk