February 2011 I N°11

NET*ALERT* Newsletter
Stay tuned

Ensuring the effectiveness of Safety Nets

WELCOME

A happy New Year to all of our readers. The last quarter of 2010 was a busy period; November saw 50 stakeholders attend a workshop disseminating the results of the 3-year PASS study. In the same month EUROCONTROL completed a survey to update its understanding of ground-based safety net implementations across the ECAC area – thank you to those of you who participated. Both studies are summarised in this issue.

Also in this issue, staff from the Maastricht UAC overview their CAMAR tool used for analysing alerts and collecting statistics; and in the cover story we summarise recent support provided by EUROCONTROL to Malta Air Traffic Services (MATS).

2011 will see the first full calendar year of SESAR safety nets activities; inside we provide a summary of plans for the year.

Finally it's all change at EUROCONTROL so we'd like to pass on our thanks and best wishes for the future to two departing members of the Safety Nets team - Hans Wagemans and Dijana Pasic.

Focus on safety nets in Malta

In recent months Malta Air Traffic Services (MATS) has been optimising its safety nets with the help of EUROCONTROL. In this article we take a closer look at the work carried out, the observations made and the resulting recommendations.

MATS invited EUROCONTROL to get involved back in March 2010, as Senior Head of ATC Operations for MATS, Joe Mallia, explains: *"We were concerned that the frequency of nuisance alerts for STCA and MSAW was a distraction for controllers, so we asked EUROCONTROL to help us optimise the system parameters and volumes".*

The support was carried out in two main stages: First, the safety nets log files and system track recordings were analysed and changes to parameter settings were recommended. Next, a new MSAW surface, with a finer resolution, was designed and the MSAW parameters further tuned with the use of some fast-time modelling.

Analysing alert logs

Track recordings were analysed alongside the recorded safety net alert logs over the same period. Each recorded alert was assessed, using a tool that displayed the recorded system tracks in both vertical and plan-view, to determine the specific cause of the alert and to make a judgement as to whether it should be considered a wanted, nuisance or false alert.

All recorded MSAW alerts were found to be the result of VFR flights which repeatedly penetrated the defined MSAW areas as they were staying close to the ground to maintain visual references. Since the controller is not expected to respond to these alerts, they are considered to be nuisance alerts. Two of these flights also provoked APW (known as Danger Area Infringement Warning (DAIW) by MATS) alerts where it was predicted that a military area would be penetrated when, in reality, the aircraft turned away before getting close.

Half of the STCA alerts were nuisance alerts due to tracks without Mode C data, mainly as a result of system tracks losing Mode C altitude intermittently near the edge of the radar coverage area. In the current system, where tracks are not correlated with the flight plan and have no Mode C data, STCA assumes that the aircraft is occupying all flight levels from the ground up and this was assumed to be the underlying reason for the nuisance alerts (this is not an issue when the track is correlated as STCA uses the Cleared Flight Level (CFL)). Other observations included false STCA alerts being generated from split tracks or generated when an aircraft track coasted (i.e. where a system track is extrapolated in the event of missing plot data).

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Focus on safety nets in Malta

continued

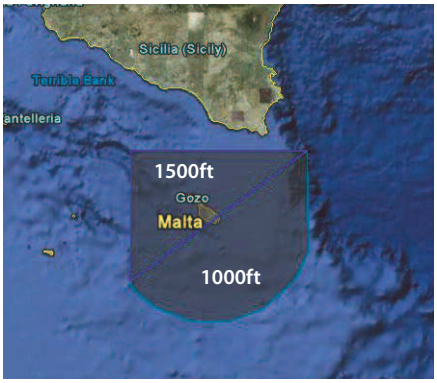
Recommended parameter changes

Using this analysis and experience from support to other ANSPs, EUROCONTROL made recommendations on parameter settings for the three operational safety nets. Following discussions with MATS operational experts and observations of the ATC system, a further set of recommendations was made. This is summarised in the table below.

Design of new MSAW surface

The existing MSAW surface was based on two MSAW areas covering the Malta TMA with an exclusion area around Luqa airport, meaning that it was only a crude approximation of the actual terrain. EUROCONTROL recommended that MATS adopt a MSAW surface which closely modelled the terrain. This would improve performance by allowing for a longer prediction time, whilst at the same time keeping the nuisance alert rate to a minimum. The proposed MSAW surface modelled the terrain with a minimum vertical buffer of 500 feet. This buffer is designed to give a good balance between the warning time and the nuisance alert rate, account for unknown objects on the ground (such as radio masts, tall cranes or vegetation) and allow for errors in the underlying terrain data.

An initial MSAW surface was developed using EUROCONTROL's PolyGen tool which takes digital terrain data as an input and generates an MSAW surface based upon the maximum number of polygons that the ATC system will support (see NET*ALERT* Issue 7). Although modelling the terrain as closely as possible, PolyGen does not take the locations of airports into account. So the generated polygons were subsequently edited to create a gap in the MSAW surface around Luqa airport to prevent nuisance MSAW alerts for every arrival and departure. The use of MSAW polygons can be extended to implement an APM-like functionality which is not present in the MATS system.



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Current MSAW areas

Current MSAW areas

A fast-time MSAW model was then used to optimise the MSAW parameters using the newly designed MSAW surface. The MSAW model identified a significant number of nuisance alerts from VFR traffic that could not be addressed through a finer resolution MSAW surface. It was therefore recommended that these are suppressed by filtering out VFR flights from MSAW.

The modelling exercise also prompted the team to seek a suitable look-ahead parameter that would minimise the number of nuisance alerts due to aircraft

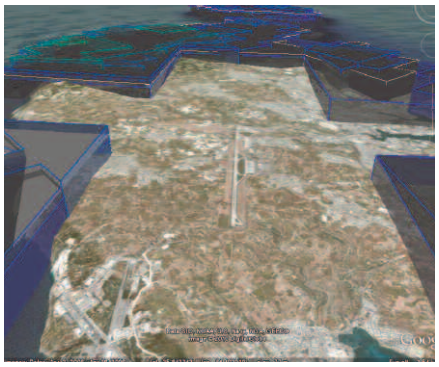
Recommendation	Reasoning	Expected benefit
Set STCA filters so that aircraft tracks with no Mode C are not processed.	STCA assumes that aircraft with no altitude information are occupying all flight levels from the ground up.	Very significant reduction in the number of nuisance STCA alerts.
Set STCA filters so that coasted aircraft tracks are not processed.	Coasted tracks generated false alerts.	Reduction in the number of STCA false alerts.
Reduce the STCA look-ahead time for 'unauthorised' manoeuvres.	Current look-ahead time is longer than that typically used by other ANSPs and contributed to nuisance alerts.	General reduction in nuisance alerts.
Increase STCA warning time.	In line with EUROCONTROL guidance.	Earlier STCA alert where one aircraft manoeuvres towards another.
Raise the floor of STCA areas outside of the TMA so as to exclude uncontrolled airspace.	Fire-fighting aircraft, not within Malta controlled airspace, generated large numbers of nuisance alerts.	Reduction in the number of nuisance STCA alerts generated outside Malta controlled airspace.
Extend the STCA region to include delegated airspace.	Flights are coming under Malta ATC as they approach from the North.	STCA protection for aircraft under Malta control.
Remove requirement for consecutive conflict hits in STCA and MSAW.	Recommendation based on previous EUROCONTROL experience with another ANSP using the same ATC system.	An earlier STCA/MSAW alert can be expected in some cases.
Set filters for MSAW areas to suppress alerts for VFR flights.	VFR flights remain close to the ground for visual references.	Very significant reduction in number of nuisance alerts.
Reduce APW look-ahead time with different times for VFR and IFR flights.	VFR flights within even slight proximity of military areas generated alerts.	A noticeable reduction in the number of APW alerts.
In a future system, consider a link between APW and STCA exclusion zones.	Military aircraft manoeuvring within APW areas generating STCA alerts.	Reduction in the number of nuisance alerts from military aircraft in prohibited / segregated airspace.

Summary of parameter recommendations

arriving at Luqa airport while keeping the MSAW exclusion area at an optimal size.

Outcomes of the work

Joe Mallia concludes: *"MATS considers that significant improvements in safety nets performance can be achieved by implementing the EUROCONTROL recommendations. In doing so, MATS needs to determine which recommendations will be implemented in the current ATM system and the ones that can be considered as operational requirements for the new system that we plan to introduce in the near future.*



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Proposed MSAW surface

This exercise will be the subject of an internal cost analysis".

"All changes to safety nets will be evaluated either on the test bed or the simulator, as well as being subjected to a safety assessment. Additionally, when new parameters are introduced, MATS will conduct training/ awareness sessions for ATCOs in order to understand the new behaviour of the safety nets".

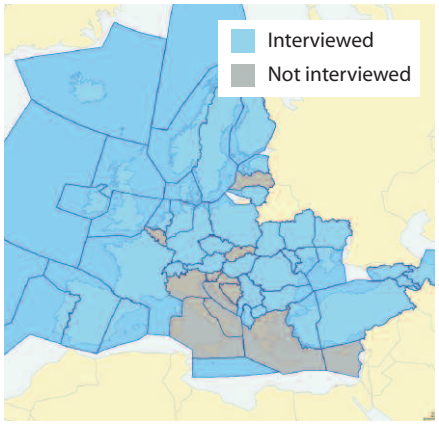
"Finally, EUROCONTROL will be kindly requested to extend its support to help MATS with the implementation of the recommendations".

Safety nets survey 2010

Six years ago, the findings of an in-depth survey of ground-based safety nets prompted the setting up of SPIN and a range of support measures for ANSPs. In June 2010, EUROCONTROL commissioned independent ATM consultancy Helios to provide an up-to-date picture of the situation today. Kevin Tucker, who led the project for Helios summarises the key findings for NET*ALERT* readers.

Kevin Tucker, Helios

The survey took place between August and October 2010. We spoke to nominated individuals from 33 ECAC ANSPs (out of a possible 44). The map illustrates the 75% coverage we achieved.



EUROCONTROL SkyView tool

Survey coverage

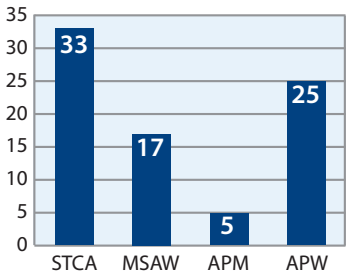
Survey objectives

- identify which safety nets are operated;
- document different experiences of safety nets implementations and operations, primarily for STCA and MSAW;
- identify any requirements for support tools;
- determine stakeholder satisfaction with existing EUROCONTROL support and obtain suggestions for improvements.

Implemented and operational

Short-Term Conflict Alert (STCA) is the most widely used of the four ground-based safety nets, with 100% of those surveyed operating it. Area Proximity Warning (APW) is also widely used, operated by 75% of those surveyed. The use of Minimum Safe Altitude Warning (MSAW) is much less widespread at 52%, despite it featuring in many ATM systems.

Approach Path Monitor (APM) is the least used of all the ground-based safety nets at 15%. This is partly explained by APM not being a feature in many ATM systems. However, this figure may underestimate the true picture since a number of respondents reported using MSAW only in the vicinity of airports, indicating that it may be configured to operate like APM. That said, 40% of respondents operate neither APM nor MSAW to warn controllers about increased risk of Controlled Flight Into Terrain.



Current safety net operations (33 responses)

Widespread tuning

The majority of respondents stated that some form of tuning had taken place, with only a small number of safety nets being operated without first being tuned. Tuning is generally done using either testbeds or simulators, potentially supported by activities such as feedback from controllers, shadow trials and in-room trials. In some instances tuning is undertaken by the system supplier or with the support of EUROCONTROL.

The findings suggest significant awareness of the need to tune safety nets. However, they also illustrate that 'tuning' can describe a wide range of activities from spending several months tuning around 100 STCA parameters per region of operation, to modifying just a small number of parameters. 'Tuning' can therefore vary hugely in terms of complexity and the effort dedicated.

Are they a nuisance?

Respondents were asked their opinion of how optimally their safety nets were operating, using a simple scale (see graphic overleaf). Respondents suggested that a key influencing factor was the level of

Safety nets survey 2010

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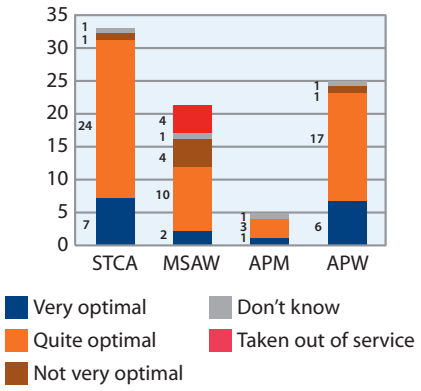


Individual perceptions of safety nets operations (33 responses)

NOTE: It is emphasised that the perception of performance presented is individual and not necessarily an ANSP view

reports/complaints made by controllers.

For users of STCA and APW, the majority of respondents perceived they were operating 'very' or 'quite' optimally. However, a number of respondents who regarded STCA as operating 'quite' optimally, noted that there is always room to reduce false and nuisance alerts further.

The picture for MSAW is different. While the majority of respondents using MSAW perceived it to be operating well (over 70% regard it as operating 'very' or 'quite' optimally), a number cited high levels of nuisance alerts, primarily associated with difficulties in tuning the MSAW surface. Additionally, four respondents reported their system had been taken out of service due to the level of nuisance alerts. There are too few implementations of APM to draw firm conclusions.

Common sources of nuisance and false alerts

Several respondents volunteered sources of nuisance alerts for STCA and MSAW (see panel below). The survey revealed that individual ANSPs, as well as EUROCONTROL through its direct support work, have developed solutions for many of these issues. While each solution has been moulded to the specific challenge of a given system, geography and traffic picture, sharing knowledge about them would be of benefit.

Feedback on safety nets

Reports and feedback from controllers are the most common methods used for determining safety net performance. Other methods, although not used as widely, are forums (either specific safety net forums or safety, technical, operational, staff and future systems forums) and the frequent collection and analysis of alerts.

Analysis tools

Over one third of respondents reported using a dedicated tool to analyse alerts, and a further third are planning to do so at some point. Such tools tend to be focussed on STCA and are used for collecting statistics on alerts and/or investigating individual alerts. Many have been developed in house, but a few are based upon an analysis function in the ATM system. This finding suggests that further dedicated analysis tool development coordinated by EUROCONTROL will not be necessary.

EUROCONTROL support

Feedback on the support provided by EUROCONTROL was gathered through a supplementary online survey, which was completed by 67% of respondents. Respondents were asked to rate the usefulness of a range of materials and activities delivered by EUROCONTROL, as well as their interest in different forms of ongoing support.

Respondents confirmed that specifications and guidance materials were useful. This was particularly true for STCA, where over 90% of respondents rated them 'essential', 'very' or 'quite' useful.

The survey confirmed the demand for SPIN and dedicated safety nets workshops. However, with 25% of respondents unaware of the existence of SPIN it also suggests that further awareness could be generated. Respondents also expressed interest in participating in interactive forums such as webinars and seminars (including system-specific seminars).

Interest in further direct support from EUROCONTROL or repeating one-to-one seminars indicated that these activities are popular amongst those ANSPs who have already received them.

The online survey found that more respondents use 'traditional' methods of indirect support like websites, guides and newsletters, rather than newer multimedia approaches like the Awareness Package, safety nets teasers and FAQ films. A number of respondents were unaware of these newer resources. However, over half of those who were aware found them to be 'very' or 'quite' useful.

Conclusions

The survey received high levels of stakeholder engagement. Respondents were generous with their time, and open with their responses. It is clear that there is a greater understanding of the issues to address (for example, tuning) than six years ago. At the level of investigation made by this survey, most respondents perceived STCA to be operating well. The focus has now shifted to MSAW, where performance is perceived to be an issue for over 40% of respondents. Here, the potential exists to use the PolyGen tool more widely to assist in the optimisation of MSAW surfaces. In doing so, consideration needs to be given to user training and support.

STCA

- Split tracks/garbling
- High rate of climb or descent
- Military aircraft (formations/training areas)
- Uncorrelated tracks at the FIR boundary
- Alerts in TMA or on approach
- Alerts due to VFR traffic

MSAW

- Difficulty in tuning MSAW surface
- Warning time parameters
- Exclusion of VFR flights
- Limitations on the number of polygons
- Lack of inhibition zones (around airports)

Common sources of nuisance and false alerts

Comment from the Safety Nets Team

We are very grateful to all respondents for participating in this survey. It provides us with a current picture of ground-based safety nets implementation across ECAC and confirms the outstanding issues to address.

PASSing the baton to SESAR

On 23rd November 2010 over 50 experts convened in Brussels for the dissemination of the results of the three-year PASS (Performance and safety Aspects of STCA, full Study) project. The amount of information conveyed on the day would fill several pages of NET*ALERT*. So below we summarise the main project tasks, how the work will be used by SESAR, the thoughts of the workshop Chairman, and we direct readers to the relevant project presentations and reports.

PASS at a glance

PASS started in 2007, however its origins are in a number of earlier projects and workshops. The overall purpose of PASS was to study performance and safety aspects of STCA operations (including technical, procedural and human performance aspects) and to consider the interactions with ACAS. In doing so PASS had two objectives:

- progress towards standards for ground-based safety nets through quantified requirements for STCA by proposing candidate operational, safety and performance requirements; and
- progress with an overall concept of operation for ground-based and airborne safety nets, ensuring compatible STCA and TCAS operations.

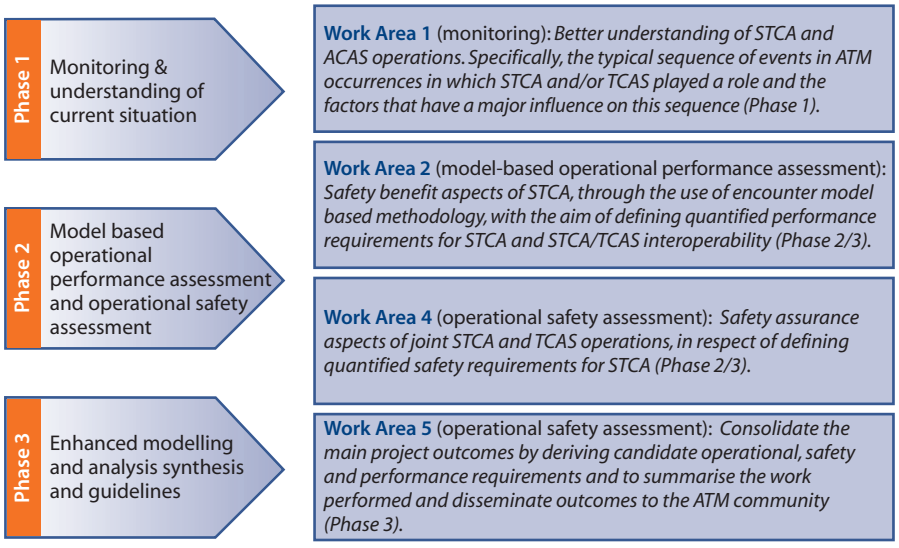
These aims were addressed through three phases and four work areas (see the diagram below). Presenting the findings of these four work areas was the focus for Egis Avia Project Manager Thierry Arino and the PASS consortium (Egis Avia (lead), QinetiQ, DeepBlue and DSNA) at the workshop.

Over 50 experts attended

Following the presentations, workshop participants were invited to discuss the project findings and recommendations. While some of the findings seemed to be straightforward, others resulted in discussions and differences in opinion. Some discussions continued in the SPIN Sub-Group meeting which took place the following morning.

PASS and SESAR

With the evolution of SESAR, the work of Phases 2 and 3 became part of the SESAR safety nets work, effectively making PASS the first completed SESAR safety nets activity. At the workshop, SESAR Work Package 4.8 (en-route and TMA ground and airborne safety nets) leader, Jean-Marc Loscos of DSNA explained that the candidate performance and safety requirements developed by PASS will be used as an input to P4.8.1 (evolution of ground-based safety nets), while, P4.8.3 (ground-airborne safety net compatibility) will make use of the encounter model methodology.



PASS phases and work areas (Work Area 3 was an optional task not pursued)

Chairman's closing remarks

EUROCONTROL workshop Chairman, Martin Griffin, concluded: *"PASS has increased the understanding of both STCA operations and the interactions between STCA and TCAS. It has also highlighted the need for greater awareness in situations such as when STCA and TCAS trigger at the same time. It also further informed the debate on RA downlink, in particular I would emphasise the need to understand why RA empty messages occur and why only in Europe?"*

"PASS has made progress towards both quantified performance and safety requirements for STCA and an overall concept of operations for ground-based and airborne safety nets, paving the way for further work to be undertaken by SESAR. This said, I'd recommend that the work move closer to operations so that the candidate performance and safety requirements can be refined to better reflect the complexity of the core European area, validated in a representative pre-operational environment and measured in the local environment. This is an area where the ANSP members of SPIN could make a valuable contribution."

"Finally, I'd like to thank the PASS consortium for their hard work, as well as expressing my gratitude to the ANSPs who provided radar data and other support to the project."

Further information: A report of the workshop proceedings, workshop presentations and PASS project reports can be found on the EUROCONTROL website:
www.eurocontrol.int/safety-nets

CAMAR - a new reporting tool for MUAC

Monitoring safety by gathering and analysing data on incidents or alerts is an important aspect of the safety management process. However, with the large volumes of data involved, and the possibility that human reporting can lead to underreporting, an analysis and reporting tool can be a valuable asset. In this article, we take a look at a tool called CAMAR (Conflict Alert Message Analysis and Reporting), developed and used by Maastricht Upper Area Control Centre (MUAC) for the collection and analysis of STCA alerts.

What is CAMAR?

CAMAR is an MS Excel-based, offline analysis tool which has two primary purposes: first to provide statistical data on STCA, for example the identification of 'hotspots' and second, to analyse individual STCA alerts.

CAMAR actually comprises two separate components for collection and display: **CAMC** and **CAMAR**.

- **CAMC** (Conflict Alert Message Collection) takes care of the collection, transformation and storage of data. It takes all tracks for which an STCA event was triggered, merges these and stores them as a single data item in an offline database. CAMC does not do any filtering or processing of data.
- **CAMAR** (Conflict Alert Message Analysis and Reporting) is the front end of the tool which extracts and displays data according to thresholds or parameters that are input by the user.

CAMAR was designed to enable users to identify locations where STCA alerts are produced although actual separation infringements may not have occurred – effectively allowing hotspots to be identified before infringements become a problem.

In November 2008, after an initial period of use in parallel to EUROCONTROL's ASMT (Air Safety Monitoring Tool – see Issue 6 of NET*ALERT*), CAMAR was fully validated and implemented - retrieving data and producing statistics about STCA events.

MUAC staff



Left to right: **Roger Fraikin** (Head of Operational Systems), **Philip Marien** (in-house investigator), **Micha Janssen** (Surveillance Data Processing Engineer and CAMAR developer).

How is CAMAR used?

To date, CAMAR has been used for the following:

- Its replay functionality in both the horizontal and vertical planes (similar to the functionality of ASMT) enables the **investigation of alerts** – within as little as 20 minutes of them taking place.
- This function can also be used to **address controller queries** regarding possible false/nuisance STCA alerts and to investigate any tracking issues such as split tracks.
- CAMAR can also be used to **assess the impact of sectorisation changes** by investigating whether there has been a shift in the location of hotspots after procedures have been changed or sector boundaries moved.

In addition, CAMAR has been used to provide a **quarterly validation** of manual reports, and input into the **development of safety cases**, by looking at how the STCA performs in a given situation and giving confidence in the strength of the ATC system.

CAMAR's strengths

CAMAR has proved to be a flexible analysis tool, allowing alerts to be analysed according to parameters defined by the user.

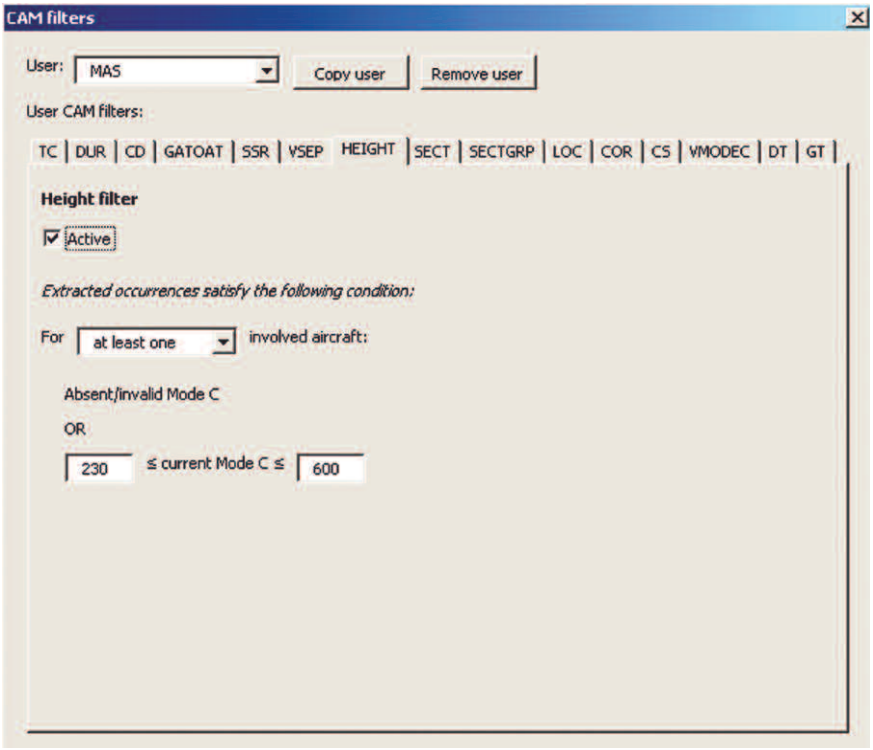
A key factor in its flexibility is the fact that it is an offline tool, as its developer Micha Janssen explains: *"With a real-time, online tool, parameters determining what data should be detected need to be defined before collection begins, meaning one collected data set cannot be compared with another if different parameters were used for collection. Being an offline tool, CAMAR relies on an historical database of raw data, from which data can be extracted based on a set of user defined parameters - for example a user could decide to analyse all events where the controller has 30 seconds warning before a potential separation infringement."*

Also, being based on MS Excel, CAMAR can be hosted on a standard office PC and does not require any specific platform or hardware.

Feedback from users

After implementing CAMAR, users immediately began to give positive feedback, pleased with its ability to deliver the statistics they needed. They also liked the speed with which they were able to perform analyses – an analysis of a three-month sample of data can typically be completed in about half a day.

MUAC's in-house investigator Philip Marien says of his experience of CAMAR: *"I found the front end of CAMAR very flexible, especially in terms of my ability to alter parameters for analysing data. Another benefit is that CAMAR was developed in-house and with a close relationship to users,*



Filtering function that forms part of the CAMAR front end.

which means that any updates or changes to the tool that we might request can be carried out within a shorter timeframe than would be the case with an off-the-shelf tool."

The tool has proved useful not only in its ability to detect problems, but also through statistical analysis enabling safety to be improved by identifying areas that should be concentrated on, for example locations in the airspace where STCA alerts are often generated.

Future enhancements

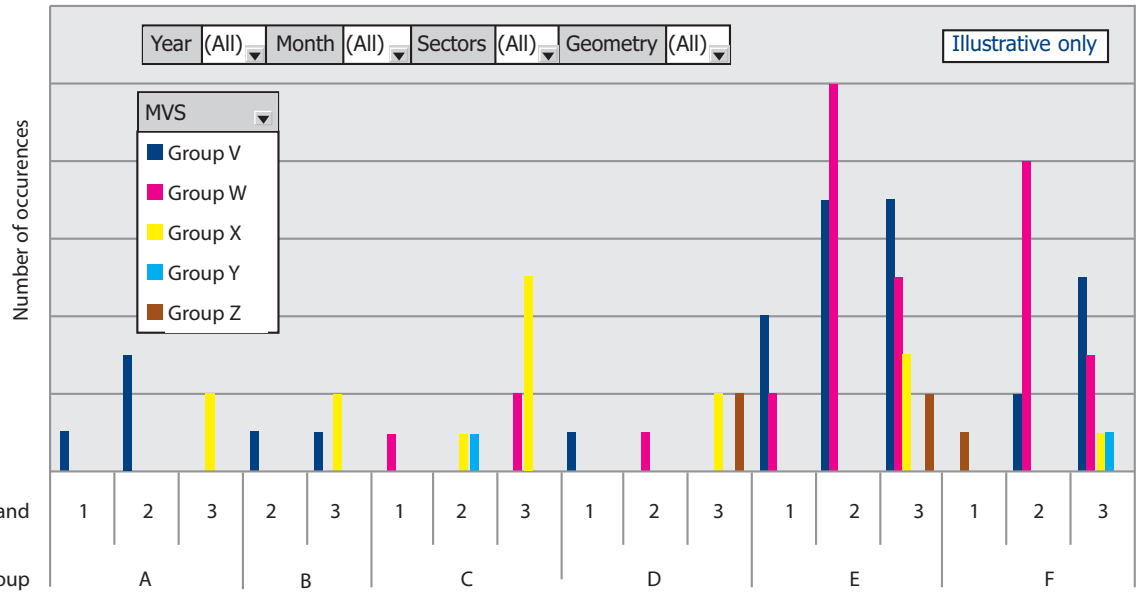
CAMAR investigates actual STCA alerts and cannot be used to validate the performance of STCA. MUAC has 30 years' experience of STCA and started with a well-tuned STCA system. This was a vital precursor to successful use of the tool.

Considerations for the future include taking a look at whether it might be possible to allow the analysis of even more data and potential situations, as MUAC's Head of Operational Systems, Roger Fraikin explains: *"At the moment, the system stores data on all events for which an STCA alert has been triggered, meaning that the extent of the database is governed by the parameters set in the operational STCA. A possible future addition to the system would be to look further ahead than the STCA and cover all situations that might occur in the next few minutes. This would mean that the data available for analysis would be independent of the criteria used in tuning the STCA to determine whether an alert is triggered."*

What ICAO says…

ICAO Doc 4444, "Procedures for Air Navigation Services - Air Traffic Management" sets out the following guidance for the use of STCA data:

15.7.2.4 The appropriate ATS authority should retain electronic records of all STCAs generated. The data and circumstances pertaining to each STCA should be analysed to determine whether an alert was justified or not. Non-justified alerts, e.g. when visual separation was applied, should be ignored. A statistical analysis should be made of justified alerts in order to identify possible shortcomings in airspace design and ATC procedures as well as to monitor overall safety levels.



Example CAMAR outputs: CAMAR can summarise occurrences in different groupings such as minimum horizontal separation (MHS), minimum vertical separation (MVS), height of the occurrence, geometry of the encounter, sector groups and time period . It is also possible to filter occurrences for which there was no Mode C information for at least one of the involved aircraft.

SESAR update

Read on for our regular update of SESAR safety nets related projects…

Evolution of Ground-Based Safety Nets (P 4.8.1)

For work area 1 (enhanced ground-based safety nets using existing down-link aircraft parameters (DAPs) in TMA and en-route environments) different options for a set of aircraft derived data have been defined for each of the ground-based safety nets (STCA, MSAW, APM and APW). An analysis of the performance and safety aspects of each option is underway. In work area 4 (roadmap and guidelines for ground-based safety nets evolution), the PASS project has been successfully completed as reported in this issue of NET*ALERT*.

Enhanced STCA for TMA operations is an Operational Focus Area in the SESAR Release 1 Plan (due by the end of 2011). An industrial prototype will be developed in 10.4.3 and undergo standalone validation in work area 5 of 4.8.1 at Thales' Rungis facility (planned for the final quarter of 2011). The development of a validation plan has started.

Partners: DSNA (leader),NATS, ENAV, SELEX, EUROCONTROL

Evolution of Airborne Safety Nets (P 4.8.2)

This project also has an Operational Focus Area in the SESAR Release 1 Plan, *ACAS Monitoring*, and will end with two distinct safety and performance assessments: one on new altitude capture laws to avoid false alerts during high vertical rate approaches and another on automatic compliance with Resolution Advisories by coupling ACAS to the autopilot. The associated validation plans have been produced in close co-operation with AIRBUS and the simulations are underway at DSNA's premises in Toulouse.

Partners: DSNA (leader),NATS, EUROCONTROL

Ground-Airborne Safety Net Compatibility (P 4.8.3)

This project continues to address ACAS RA Downlink. A draft preliminary operational concept is being reviewed by a broad group of stakeholders.

Partners: DSNA (leader),DFS, AENA, INDRA,AIRBUS, EUROCONTROL

ACAS Monitoring (P 15.4.3)

A first version of the system specification for the ACAS Monitoring system has been produced and system development is underway. Site surveys for the locations of the two ACAS Monitoring Ground Station sensors and the installation of an ACAS Monitoring Background system in Germany have been completed.

Partners: THALES (leader), INDRA, EUROCONTROL, DFS

Safety Nets Adaptation to New Modes of Operation (P 10.4.3)

This technical project will begin with the development of system requirements, followed by the development of a prototype, aimed at enhancing STCA specifically for TMA operations (see 4.8.1 above). The system requirements will be extrapolated from the EUROCONTROL Specification and Guidance material for STCA.

Project 10.4.3 will also define a performance evaluation method for safety nets, for instance using results from the prototype enhanced STCA for TMA operations. The evaluation method will use a statistical approach and be developed on the basis of industry and ANSP methods, as well as the outcomes of studies such as the PASS project.

Partners: THALES (leader),DSNA, ENAV, EUROCONTROL, INDRA,NATMIG, SELEX

Snippets

SPIN meeting: The next meeting of the SPIN Sub-Group will be hosted by DFS in Langen, Germany on 23rd and 24th March. On the agenda will be the draft EUROCONTROL Specification for the display of RA Downlink. If you would like to attend or find out more, please contact the Safety Nets team.

Fond farewell: 2011 sees the departure of two members of the EUROCONTROL Safety Nets team – Hans Wagemans and Dijana Pasic. Hans will be retiring in March after spending 5 years with the safety nets team where he was instrumental in developing our capability to provide hands-on support to ANSPs, including developing the PolyGen tool to help optimise MSAW surfaces. Dijana has moved to skyguide to take up the post of Safety Officer. Dijana joined the team in 2008 where, as a trained controller, she provided operational input to our work and was a key member of the team holding one-tō-one seminars with ANSPs. We'd like to thank Hans and Dijana for all of their hard work and pass on our best wishes for the future.

Contact

Contact us by phone:
Ben Bakker (+32 2 729 3146),
Stan Drozdowski (+32 2 729 3760) or by email: safety-nets@eurocontrol.int