Twenty Seventh Meeting of the
Informal South Pacific ATS Co-ordinating Group
(ISPACG/27)

Auckland, New Zealand
27 February – 01 March 2013

Agenda Item 6 – Other Business

Introduction of Automated Conflict Detection Tool Alerting

Presented by Airservices Australia

SUMMARY

This information paper provides an update on the implementation of automated conflict detection software in Australia's Eurocat ATM system.

1. INTRODUCTION

1.1 For a number of years, Airservices Australia has been working towards the implementation of automated conflict detection software, where responsibility for detecting conflicts (in some airspaces) would eventually be transferred from the controller to the ATM system. The controller would then be responsible for investigating reported conflicts and implementing an appropriate resolution.

1.2 While the software has been available in the system for some time, a number of issues had to be addressed; including validation of the software and configuration, regulatory issues and system availability. Addressing these issues has caused considerable delays to the implementation of the conflict detection software.

1.3 To enable full implementation of delegated conflict detection, a staged process was eventually agreed upon. The initial implementation provides a procedural "safety net" (i.e. a similar concept to STCA), and is referred to as FPSNA (Flight Plan Safety Net Alert).

2. DISCUSSION

2.1 By the end of January 2013, all controllers responsible for the Oceanic airspace to the east of Australia were using this new tool.

2.2 Controllers still identify potential conflicts using existing techniques. FPSNA is used to provide an additional layer of protection in the event of an undetected conflict, or to detect events such as when a minor estimate revision occurs for aircraft operating at the separation minima results in a potential loss of separation.

2.3 The Safety Net Alert implementation is based on a 'look ahead' of 15 minutes prior to the conflict start time. Conflict trial probe functionality is currently disabled, however it is intended to introduce this functionality in the next stage of the project.

2.4 Controllers are alerted to a potential break down of separation by a notification in the "sector conflict window". If required the area of conflict can be graphically displayed. Based on this information, the controller can take appropriate action, which may involve taking action to resolve the potential conflict (via an amended clearance) or simply acknowledging the alert (e.g. if the conflict is being solved using an alternative separation standard).

Figure 1. Sector conflict window

2.5 As the conflict becomes "imminent" (3 minutes prior to conflict start time), an FPCW "alert" is displayed on the track labels of the aircraft pair in conflict (Figure 3). An aural alert is also generated.

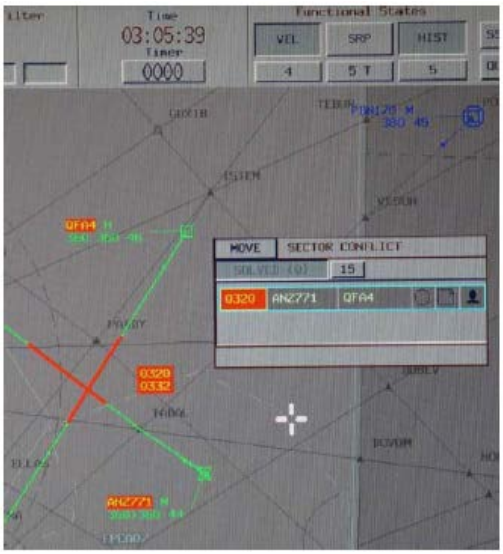


Figure 2. Display of the conflict "area"

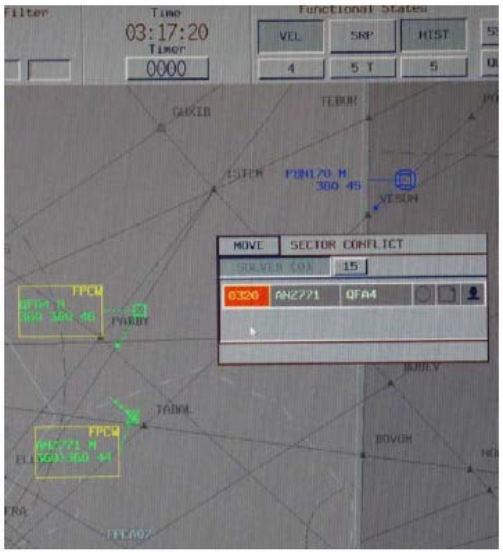


Figure 3. FPCW warning displayed 3 minutes before conflict start time

2.6 Flight Plan Conflict Areas

2.6.1 The airspace in which safety net alerting is available is divided into a number of polygons, referred to as flight plan conflict areas (FPCAs). In each FPCA allowable tolerances for each aircraft are defined off-line. A variety of information is used by Eurocat to determine which tolerance is appropriate for each aircraft pair, including flight planned navigation capabilities, surveillance coupling, etc.

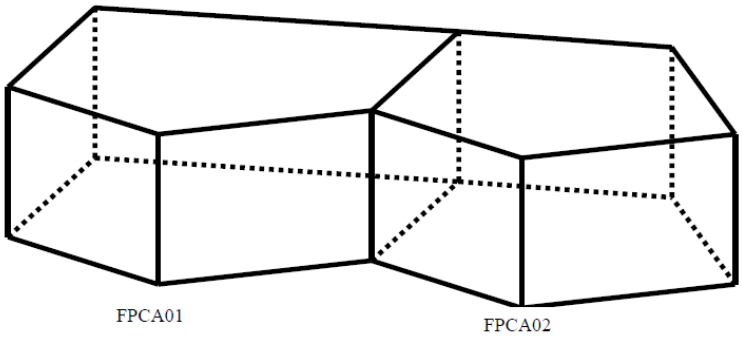


Figure 4. Depiction of two FPCAs

2.6.2 Considerable effort is being spent fine tuning various parameters to reduce the number of 'nuisance' alerts generated while retaining those which are of operational benefit to the controller. Most nuisance alerts can be categorized as conflicts for which the controller is not responsible, and those which do not conform to the controller's expectation of the situation (e.g. under/over-estimated climb performance, unexpected depiction of conflict geometry).

2.6.3 This task is complex due to the large variety of separation standards that are available for controllers to apply within this airspace, some of which require controller intervention before they can be applied. These separation minima range from 5NM for identified aircraft (radar and/or ADS-B), longitudinal separation minima ranging from 30NM for RNP4 and 50NM for RNP10 aircraft otherwise time separation of 10 or 15 minutes. Lateral separation minima of 15NM, 30NM, 50NM are also available.

2.7 Next step

2.7.1 The next step involves extending the look-ahead parameter to 30 minutes and enabling trial probe functionality. The aims are:

- to reduce the urgency of responding to notified conflicts (via the longer look-ahead);
- to allow the aural and visual alert to be preemptively disabled for conflicts where the controller is consciously applying a smaller separation standard;
- to familiarize controllers with the trial probe HMI.

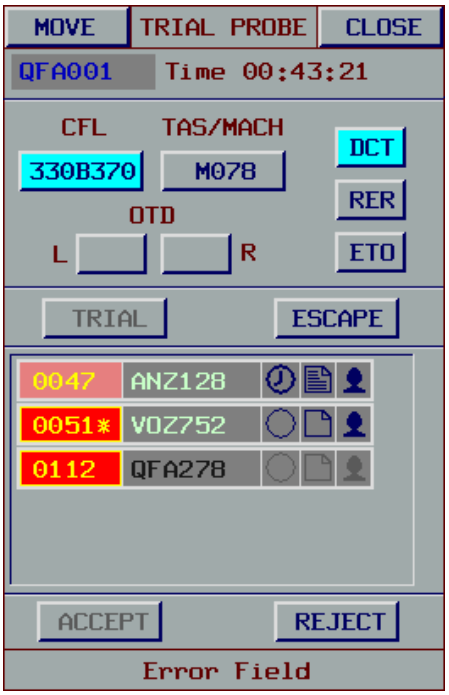
2.7.2 Controllers will remain responsible for detecting and resolving conflicts during this phase.

2.7.2 To support this proposal, work is continuing;-

- monitoring the current FPSNA implementation to identify any potential issues
- fine tuning FPCA areas and the parameters applicable within them,
- identifying any required software enhancements for future applications.

2.8 Future plans

2.8.1 The proposed end state would see the role of conflict detection transferred from the controller to the ATM system. The controller would then be responsible for acting upon conflicts notified by the ATM system.



2.8.2 The trial probe will be used for resolution support and to directly update flight data with the accepted solution. The trial probe will allow the testing of modified clearance parameters such as:

- Levels (including block levels)
- Speed
- Direct tracking
- Reroutes
- Time revisions
- Off track deviations

2.8.3 The HMI interaction with the trial probe window is via pop up menus allowing the easy entry of data to trial.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Note the implementation of FPSNA in the oceanic airspace east of Australia;

b) Note the future work to eventually transition to ATM system conflict detection.