

SAFETY SUPPORT FOR OPERATIONAL EFFICIENCY

Does safety always have to conflict with productivity goals? No, says **Maria Kovacova**, who describes how safety resources can also be used to support efficiency and overall system effectiveness.

In aviation organisations, safety specialists are not usually associated with improved capacity or efficiency. But safety does not always have to act against other goals. During my career in ATM safety, I have witnessed situations when safety practitioners, using safety tools and methods, have helped line management to balance operational performance and safety needs, sometimes optimising both goals at the same time.

One such situation concerned how to set the 'right' volume of traffic passing through sectors so that ATCOs can still safely manage and control the situation within their areas of responsibility. At the time of discussion, we were lucky; we had a few years of experience, and records from the EUROCONTROL automated safety monitoring tool (ASMT). This tool records different types of safety-related situations such as short term conflict alert (STCA) or pre-STCA. In the case of pre-STCA, where an ATCO solves a potential conflict, an STCA is not triggered.

At that time, the parameters of STCA were set as 5 NM (horizontal) and 90 seconds (triggering time parameter). The parameters for pre-STCA were set at 6 NM and 120 seconds. If one of these parameters were exceeded, the ATM system at the ATCO radar position generated a visual for pre-STCA and a visual and audio alarm for STCA. Safety experts identified during an internal safety audit that in some situations, the capacity of certain sectors was exceeded by 25%, and in some cases up to double the defined maximum capacity values (as set by EUROCONTROL).

Safety professionals and tools can be used to help ensure overall system effectiveness.

Figure 1: Number of movements and number of pre-STCA (illustrative data)



Figure 2: Number of movements and number of STCA (illustrative data)



This overload of capacity values caused the ATM system to trigger more pre-STCA warnings, which led to STCA warnings and in some cases to loss of separation minima.

During the audit interview, some ATCOs were complaining about workload and stress due to overload of the sectors, and some supervisors confirmed that demand for traffic was higher than set capacity values. Supervisors and ATCOs also confirmed that for some sectors, defined values were obsolete and needed to be updated as they were not reflecting operational good practices, procedures and needs.

Findings from the internal safety audit escalated into a tense discussion about a sensitive topic – sector capacity values. Naturally, managers want to have findings supported by facts and numbers, and not only based on the staff perceptions. So the safety unit decided to take out data from ASMT and tried to find the correlation between volume of traffic and numbers of triggered pre-STCA warnings, which continued into STCA warnings. Figures 1 and 2 show illustrative graphs, similar to those presented to management.

Each graph represents the volume of traffic per ACC and the number of generated pre-STCA and STCA warnings, covering a period one year. These numbers were also supported by safety analysis, which was an important input into the safety assessment of new capacity values and procedures for ACC. The change of capacity values was also supported by voluntary reports from operational personnel, and analysis of those reports. The

investigation proved that in some cases the maximum capacity values per sector were exceeded by double. These inputs helped to improve the whole system used for flow management.

Based on these results, the top management opted for a new capacity study, conducted by EUROCONTROL. After discussions with supervisors and safety experts, it was found that procedures and capacity values defined in previous years were no longer relevant and couldn't meet traffic demand. It was found out that sectors had to be modified to distribute traffic in a more balanced way. A new approach to airspace design and sectorisation would help to prevent overload of certain complex sectors.

The capacity study showed that in some modified sectors the capacity value could be higher than had been set in the past. Sectors were redesigned and new procedures were developed, along with a new approach to traffic flow and sector management.

At the end of three years of discussions, analyses, assessments, and simulations, the company achieved a good result. We increased the volume of traffic managed within our airspace, and we also helped to ensure safety by the re-design of sectors, the introduction of new capacity values into CFMU, and new procedures for flow managers and supervisors.

The experience showed that safety and efficiency don't have to conflict. Safety professionals and tools can be used to help ensure overall system effectiveness. S



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