CARMEN SYSTEMS
RESOURCES IN BALANCE

Carmen Fleet Control

Airlines

Carmen Fleet Control is the process to recover quickly and produce recovery options for disruptions with as little change as possible with maximum service level retained.

Maximizing service levels while achieving stability

The process

Define scope

Define areas of responsibility, for example a fleet or a specific hub.

Detect

The integrated view presents an alert when an aircraft is affected by a problem. The alert can for example be 'Short aircraft turnaround time'.

Solve

By clicking the alert in the view you can see the affected aircraft's routing. Based on this you can make changes manually, such as cancel, delay or swap flights. You can also use the optimizer to solve one or several problems. The optimizer produces various options, using many different solution strategies.

Evaluate

The recovery options are ranked in efficiency order, but you can always select any option. The system presents an overview of the consequence of each option in terms of delays in minutes, cancellations, tail swaps and equipment type changes. You can inspect each option in detail using a graphical view, which can be manually adjusted if required. You may also evaluate one or many proposed crew recovery solutions from a fleet and passenger perspective.

Communicate

Once a repair option is chosen it is communicated to the central database as soon as you have confirmed the changes. The changes are now available for everyone using the system.

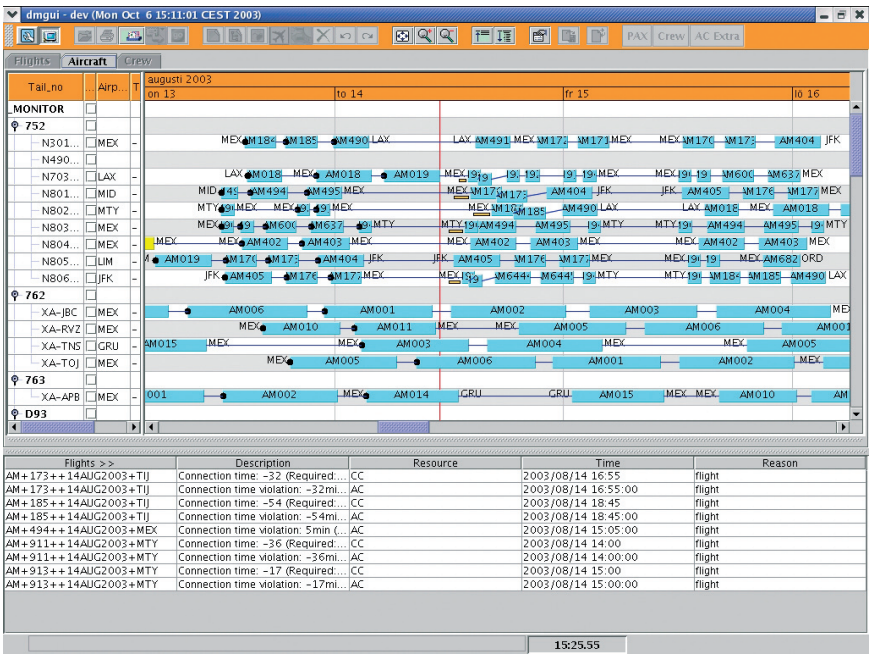
Recovers disruptions on the day of operation as quickly as possible with as little change as possible to retain maximum service levels

Integrated with

Carmen Crew Control and Carmen Passenger Recovery to guarantee solutions that are feasible and effective for the entire operation.

Existing day-of-operation systems to recover as quickly as possible with as little change as possible.

Existing systems for operational data management to ensure maximum service levels for passengers.



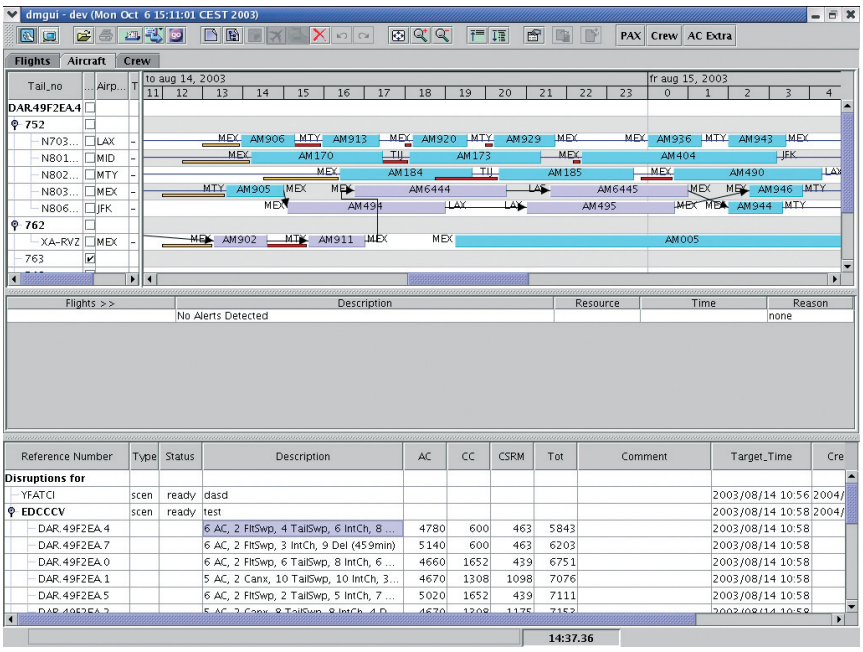
This view shows alerts for a set of delayed flights.

Product content

- Fleet Recovery optimization
- Graphic Fleet Editor
- Regular new releases
- Standard support (office hours support and regular Installation Quality visits)

Technical information

- Web clients
- Unix or Linux server
- Standardized XML interface
- Oracle database



This view shows the recovery option for the selected disruption.

Basic functionality

Carmen Fleet Control produces recovery options for major and minor disruptions. An option can contain any combination of re-timings, internal and external fleet swaps and cancellations.

Speed
The optimizer will rapidly produce high quality solutions within one minute for any kind of disruptions such as a closed hub or an impaired aircraft.

Setting objectives
You can easily investigate different trade-offs, for example between a quick recovery and a low operational cost or between minimum changes and a stable operation. You can also set exact limits, for example an upper limit for the number of flight swaps or maximal re-timings.

Legality control
All legality and quality is controlled through a parameter interface. This guarantees that alerts and suggested recovery options will always respect the company's legality and quality policies. You can control properties such as desirable flight patterns, restrictions caused by operational deficiencies of individual aircraft, the stability of maintenance activities etc. You can also add costs and regulations based on crew and passenger aspects.

Changes can be introduced at short notice by the local system administrator. This ensures that the system delivers the best possible solutions, even after changes to fleets, timetables, company policies, planning processes etc. You can define the cost for delaying or cancelling a passenger, breaking a fixed crew link or delaying a flight over the crew drop dead limit.

Integrated operations control
Carmen Integrated Operations Control is a platform for integrated disruption management. It integrates the Carmen tools for Fleet Control, Crew Control and Passenger Recovery.

System integration
Carmen Fleet Control is a stand-alone system designed to work in an integrated operations control environment. It can also work as a decision support tool on top of existing systems for operational data management.

Questions & Answers

What value can optimization bring on day of operation?

The main benefit from introducing optimization is that it provides control. The controller's role is changed from simply reacting to individual alerts to being in control of the consequences of different recovery strategies. The optimizer can also be used proactively to analyze the stability of the current operation, for example to detect flight delays or cancellations and thereby avoid major problems later that day.

The optimizer evaluates the possible solution strategies and provides effective means for comparing the different solutions. To consolidate the operation the optimizer can use commercial information to upgrade and downgrade flights causing minimum disturbance to passengers.

How can the optimization help us with major problems, such as a closed hub?

By solving the entire problem, rather than trying to solve each sub-problem separately, it is possible to evaluate the full effect of a solution strategy before applying it. Recovery optimization focuses on specific properties such as the number of changes, the time to recover to original patterns, cost impacts, passenger disturbances etc. You can combine a number of required properties to look for the best trade-off between a quick recovery and a low operational cost.

How can Carmen Fleet Control support crew constraints?

Carmen Fleet Control can use basic crew information like aircraft and crew connections, on which the crew planning depends. It is also possible to pre-process information to generate re-timing limits for each flight. The limit describes to what extent each flight can be re-timed without violating rules, for example duty hour rules. With Carmen Crew Control you can make detailed analyses for individual crew members.

How can the Carmen Fleet Control system work in an environment of continuous change?

The most important factor is that Carmen Fleet Control is very fast. Major changes are unlikely to occur while the optimizer is running. However, if changes do occur which makes parts of the solution invalid, you have three options: accept part of the solution and repair it manually, accept part of the solution and repair it with Carmen Fleet Control, or reject the solution in its entirety and start a new optimization job.

If you have any questions about Carmen Fleet Control, please contact us at carmen@carmensystems.com

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