Tutorial #4: Decision Aid Methodology
10th May, 2011

THIS DATA IS CONFIDENTIAL!
PLEASE REMOVE IT AT THE END OF EACH LAB SESSION!

CrewLogic - Crew Rostering

In this tutorial , we will use the crew rostering algorithm to generate feasible rosters for the flight commander and the first officers for the data of April, 2010.

1. Start CrewLogic.

2. Load the data for both DH4 and EM9 for the first week of April, 2010.

3. Run the anonymous crew pairing once and save the data. If some crew routes are not covered, check the parameters of the optimizer and make sure all legs are covered.

4. Run the crew rostering for CMD. Compare the number of anonymous pairings on a single day, and the number of affected pairings.

5. Compute the theoretical minimum number of crew required. Is there anything unexpected? Explain why! (look at the crew composition for the red and green pairings)

6. We will now fix the problem by updating the crew composition for each leg. To do so, first clear all you have done in CrewLogic (either by clearing all pairings, or by closing APM, removing the database file and re-extracting it from the ZIP file).

7. Once the database cleared, reload the data of the first week of April, 2010 (there should be no pairing). Legs in red are legs for which the crew composition is undefined.

8. To fix the problem, load the data in SchedulePlanner, select on leg with undefined crew composition, then right-click on it and go to Sector / Serie . . . -> Edit / Delete . . . , then click on the Crew icon (bottom of the frame). There should be 1 CMD, 1 FO, 1 SCCM and 1 CCM and two entries in Qualification By Group On Aircraft. Click Apply, then on Update (accept changes).

9. In CrewLogic, reload the data - the red leg should now be yellow! Repeat the operation until all legs are yellow! (NOTE: By updating a whole series, all the flights of April, 2010 will be updated!)

10. When all legs are yellow, run again the anonymous crew pairing (check the parameters of the optimizer again if some legs are not covered). Save the data.

11. Look closely at the schedule. Guess the minimum number of crew required. In the optimizer, update the value of parameter "Estimated minimum number of crew" with your guess.

12. Compute the theoretical minimum number of CMD and FO for:

- the first week using both DH4 and EM9 fleets simultaneously,
- the first week using DH4 and EM9 independently (you have to solve the problem for each fleet!).

Is there any difference? Explain!

13. Repeat the previous question for the CMD role only, but for 2 weeks and for the whole month of April, 2010. Do you observe any difference? Explain why! (Note: to accelerate the computation, use as estimated crew needed, the number of crew found previously).

14. Now, for the first week of April, 2010, load the following crew members: DGU, DLA, EKU, BAB, FTA and JPG (NOTE: press CTRL + L to load crews, and type the crew codes with a space in the list of crews).

15. Run the crew rostering algorithm for the CMD role. Describe what you observe.

16. Reload the month of April, 2010 for fleet DH4 and the corresponding CMD crew (ensure that pairing is assigned). Look at the different parameters ("Page 2") of the optimizer, and generate different solutions using different values (focus on the first 3 parameters only). Describe the differences in the obtained solutions.

17. Finally, perform the crew assignment for all crew members (iteratively, for CMD, FO and SCCM and CCM). Is the schedule feasible?

Note: This tutorial is a modified version of the one prepared by Dr. Niklaus Eggenberg for the "Decision Aid Methodology" course for Spring 2010 session.