CADEO
Controller Assistance for Departure Optimisation
– a brief introduction –

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CADEO

- Is a controller assistance system for departure optimisation,
- Is the improvement of the Eurocontrol-DLR DMAN,
- Provides A-CDM support through TTOT and TSAT calculation,
- Is an operational prototype, easy adaptable to airports,
- Is able to be connected/coordinated with an AMAN,
- Provides HMIs for Clearance Delivery, Ground/Apron and Runway/Tower Controller,
- Makes available planning information for other systems e.g. to integrate with an operational EFS or other HMI.
CADEO Features

- Calculation of an optimized departure sequence
  - keeping the required separations
    - Departure-Departure
      - Wake vortex
    - SIDs
    - Departure-Arrival
    - Arrival-Departure
  - based on flight plans, EOBTs, TOBTs, CTOTs, standard taxi times

- Calculation of Target Takeoff Times (TTOT)

- Calculation of Target Start-up Approval Time (TSAT)
  - Start up of the engines as late as possible
  - Be at the runway „just in time“
CADEO Features

- Adaptation to
  - Plan deviations
  - Controller interventions
  - Flight plan updates

- Multi Objective Optimisation

Objectives:
- Maximise capacity (throughput)
- Minimise taxi-out delays
- Maximise CFMU slot compliance and punctuality
- Maximise planning stability (similarity between consecutive takeoff schedules)

Planning Strategies
- Combination of the objectives with different weights
CADEO References

- Real time simulation for Arlanda Airport, Stockholm, within Gate2Gate project (2004, 2005). CADEO was integrated with i-acs HMI.
- EMMA and EMMA2 (2004-2008). Real time simulations with CADEO and with CADEO integrated with EFS and passive shadow mode trials at the airport Prague.
- Integration with Barco AMAN OSYRIS (2004).
- Coordination with DLR AMAN 4D-CARMA and ADCO (AMAN DMAN Coordinator) (2005).
- Coordination with DLR’s pretactical planner TOP (Total Operations Planner) (2007).
- Simulation trials with Arrival (4D-CARMA) Departure (CADEO) Coordination supporting displaced threshold operation for Frankfurt Airport (FP6 project OPTIMAL) (2007-2008).
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