



Si ATM DMAN

”Si stand-alone Departure Manager”

Si DMAN is a stand-alone departure management system that can be integrated into most environments. It supports Air Traffic Control flight data operations for Tower (TWR) and Approach (APP) control functions. It was first launched for operational use in 2012 and since then has been upgraded with new functionalities as defined and requested by the ATM community. DMAN requires the concept of Airport Collaborative Decision Making to be implemented.

Overview Functionality

The following functionality is included in the Si DMAN:

- Determine the Target Take-Off Time and Target Start-Up Approval Time for every aircraft
- Determine the pushback sequence for all departing aircraft
- Departure the takeoff sequence for all aircraft
- Present the sequences to controllers

DMAN optimizes a sequence for departure for the point where the airport capacity is most constraint. The most common airport bottlenecks are the runway or the apron area. In some cases of multiple airports in close proximity, the terminal maneuvering airspace (TMA) sector can be the limit, for when DMAN can determine TMA exit times. When the airport has de-icing operations the resources can become the new bottleneck, for which DMAN can optimize operations.

DMAN is a flexible controller support tool that enables optimizing the airports bottlenecks provided that sufficient aircraft status and progress information is available.

Tasks and operators

DMAN is an automated application that uses aircraft turnround progress information, flight plan, as well as departure constraints as input to determine the pushback and take off time. The Clearance Delivery controller in the tower is the main position who uses the proposed sequence and based on that provides the clearances to the aircraft in the right order. The ground controller monitors the runway sequence where needed, and feeds the traffic in the right sequence to the runway.

The runway controller has priority to maintain safety. Hence he will let departing aircraft line-up and take off based that priority. Where the traffic is fed in the most optimal sequence, the runway capacity and, during mixed mode operations, the gaps between the arrivals have been optimized.

Data Management

DMAN is strongly dependent on the status of the aircraft during turnround. Airport Collaborative Decision Making (CDM) is the main methodology or process to achieve the collection of progress information from various airport parties such as aircraft operators, ground handler, airport operator, air traffic control, and flow management.

The Airport CDM process, standardized by Eurocontrol and implemented widely in major European airports, aims to achieve accurate predictions of the pushback time by the ground handler and aircraft operator. Using the aircraft status and progress information, as well as slot times provided by flow management regulation and/or the traffic demand on the airport, DMAN can determine an efficient sequence for pushback or take off.

ATC Functions

Integrated Label: controllers will have output of DMAN such as sequence number or pushback/take-off times per flight integrated in the flight label.

Integrated Electronic Flight Strips: controllers will have output of DMAN such as sequence number or pushback/take-off times per flight integrated in the electronic flight strip.

Clearance Delivery Controller HMI: A timeline HMI where all flight are presented in a sequence per runway or other bottleneck resource that is optimized.

Probe function: The application offers to enter various constraints or scenarios without activating them, in order for the controller to anticipate consequences.

Main Operational Features

- The functionality supports ACC, APP and TWR operations
- Traffic situation can be shown as “planned sequence” in a time oriented window
- Flight plan data is presented and operator interaction is performed in lists and labels.
- The design of these HMI objects is to present only the required data, however, additional data is easy to retrieve, with a click of the mouse
- Lists and labels are specially designed to support control of the air traffic in a paperless environment.
- Each flight plan is dynamically updated based upon controller input of clearances/instructions given verbally or as part of CPDLC. Input facilities are available in any of the flight’s HMI objects.
- Internal co-ordination is performed silently through system functions, including that co-ordination between controllers in TWR and APP.
- Coordination with adjacent centres is performed by means of OLDI/AIDC where such connections are available.
- The dynamic handling of the operational configuration allows a highly flexible use of the airspace. Reconfiguration of sector jurisdiction is handled in a decentralised manner. The system supports on-line reclassification of sectors.

Technical Features

Commercial hardware and software

- COTS workstations with monitor(s), keyboard and mouse
- Fault-tolerant servers
- Redundant LAN
- Unix / Linux operating system
- X Window / Motif
- Application software is in C, C++ and ADA

General Design aspects

- Client/server concept
- Open system architecture
- Distributed processing
- Fault-tolerant software



Landsvägen 39, SE-172 63 Sundbyberg, Sweden
Tel + 46 8 98 23 00 • Fax +46 8 98 31 98
si@siatm.com • www.siatm.com

The Swedish ATM systems experts since 1981.