

FBS – Fallback System

Si ATM's fallback system can safely clear the sky in case of main system outage or operate as long as needed without degrading any functions.

REQUIREMENTS

- FBS runs continuously in parallel with, but independently of, the main system
- FBS is designed to be resilient to circumstances that cause the main system to fail.
- FBS is aligned with the main system regarding operational information, such as the correlation data, latest clearances and flight jurisdiction
- FBS may differ if required from the main system regarding functionality, but some functionalities are indispensable, such as radar data processing, track presentation with callsign in labels, cleared level, safety net functions etc.
- FBS uses an identical HMI to the main system
- When switching to FBS, controller does not have to move to another position, and may use the same input/output devices as for the main system.



SOLUTION OVERVIEW

The following aspects have been applied:

- Individually adapted HMI is similar to each main system. This minimises the need for training on FBS, stress and risk for controller mistakes at emergency switchover to FBS.
- Sharing equipment, the same keyboard, monitor and mouse with main system
- Same surveillance data is used as in the main system
- Adapted functionalities, especially related to safety nets, to the main system
- Functional redundancy on system level from active server to data-aligned standby server
- One-way connection from the main system provides FBS with essential operational information such as flight plan data, SSR code assignments, clearances, flight jurisdiction status, barometric pressure, etc.
- Separate FPL database is maintained by FBS if connected to the AFTN. As such it has the capability to work independently, i.e. without receiving data from the main system. In this mode FBS automatically processes ATS messages from the AFTN.
- Qualifies as a main system if it is implemented with redundant configuration regarding server and other equipment which enables availability requirements
- Mitigations of system errors and high availability are achieved by hardware redundancy on server and communication level, fault tolerant duplicated servers, redundant network configuration
- Upgradable to a complete, full scale, state-of-the-art ATM system since it is built with components of Si ATM main operational ATM system

FBS – Fallback system

FUNCTIONAL AND TECHNICAL SUMMARY

The main purpose of FBS is to provide controllers with automatic support in case of:

- sudden unexpected failure of main system,
- planned switch-off of the main system for shorter periods,
- unavailability of the main system for longer periods.

Main functionalities and technical aspects may be noted:

- Sensor data processing, with true multi sensor tracking
- Elementary and enhanced Mode-S
- Handling of flight plans adapted to what the main system can provide
- Full set of safety nets developed according to EUROCONTROL specifications
- Interface to the main system, AFTN, MET-services etc.
- Recording and playback, including voice
- Dual redundant or single configuration
- Standard SNMP monitoring can provide data to central monitoring systems
- Automatic adaptation to connected monitors, i.e. can use the same monitors as the main system via a KVM-switch
- COTS hardware and Linux operational system

AROUND THE GLOBE

HONG KONG



UFS is a contingency, test and development system for the new Hong Kong ATM system for en-route and approach control.

It is mainly intended as a clear-the-sky system. It receives surveillance data from radar and ADS-B stations. UFS consists of 100 working positions.

CROATIA



ARES is contingency, test and development system for en-route and approach in five sites: Zagreb, Pula, Zadar, Split and Dubrovnik.

It receives surveillance data from radar, ADS-B and MLAT stations. ARES has redundant fault-tolerant system configuration. ARES is connected to the AFTN, processes flight plan data automatically and FPL data received from the main system is extensive. ARES consists of 70 working positions.

SERBIA AND MONTENEGRO



FASOS is the contingency, test and development system in Serbia and Montenegro. It has the same functionalities, and more, than the main system. It can handle

outages of the main system enabling and normal traffic management in non-degraded conditions.

FASOS is connected to the AFTN and processes extensive flight plan data automatically. It provides multi sensor tracking, safety nets and has redundant fault-tolerant system configuration. ARES consists of more than 70 working positions.

