FALLBACK suite

A fully integrated solution for En-Route and Approach Traffic Control

FALLBACK suite

» **Mission:**
The FALLBACK suite guarantees the operational continuity in case of failure in the MAIN system, avoiding the "common mode of failure". It is used to maintain available flight plan data, in order to allow a contingency function during an undetermined time and to provide the data flight records for statistical purpose.The suite can represent an independent entity and can be used as a MAIN system.

Operational scenario:
FALLBACK Suite provides a completely autonomous and independent system for the airspace situational awareness and management, specifically suited for Approach and En-route operations.

Key benefits:
- Backed by ENAV, supported by suitable consulting services. Operator training, guaranteed updates
- Full end-user command of the operations,
- Control of the entire operating environment,
- System and operational configuration such as radar sources update
- High Customizability (ex.: Airspace description reconfiguration, sector configuration, strip format setting and others);
- Scalability - the system may grow corresponding to any customer needs grow and may be enhanced both in size and in functionality
- Modular design allows integration of additional modules and subsystems.
- Low running costs
- "Common mode of failure" elimination
- Immediate availability thanks to constant alignment of input data and orders with the main system
- Increase the availability of flight data
- User-friendly interface

The flight plan data availability is essential for the safety.

Main technical features and overview:
- ATCO displaying the flight plans in order to control and plan the traffic
- ATCO input for clearance and orders
- Flight plan updating and distribution to the controller working positions and assistant working positions
- Coordination between sectors

- OLDI-based Ground-to-Ground coordination between boundaries ATSU
- Flight transfer and assumption of Control.
- Operative room configurations
- A full and integrated information sight that takes into consideration the contribution from both surveillance and FDP systems (e-CWP)
- Mode S information displaying on both radar labels and dedicated flight lists
- Acquisition, displaying and management of meteorological information and NOTAM messages (WS ADP)
- Automatic or manual printing of departure and arrival strips of the flights
- Definition of a full geography of the FDP system, according to the AIRAC documents (e-Maps Suite)
- Technical supervision of the state of each system in the Suite
- Recording of all operations performed by ATCOs to manage the flights (RPS)
- Graphical monitoring of FDP operation (MFA)
- 4D Flight trajectory computation
- Correlation between flight plans and radar tracks, by means of SSR code for Mode A radar tracks, and by means of Callsign for Mode S radar tracks (CORLM)
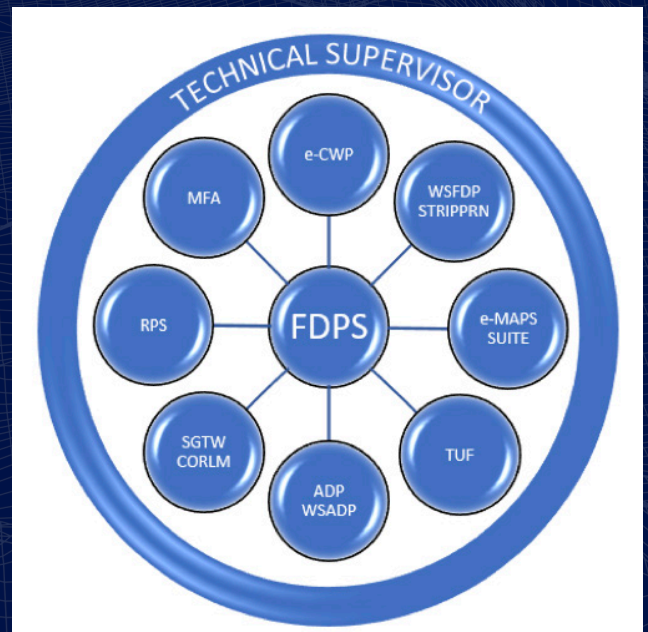
The FALLBACK suite consists of the following components:
- **FDPS** (Flight Data Processing System)
- WS FDP (Workstation FDP)
- TUF (Traffic Update Feeder)
- ACC e-CWP (Controller Working Position ACC)
- CORLM (Correlation Manager)
- TECSUP (Technical Supervisor)

- ADP (Auxiliary Data Processing System)
- WS ADP (Workstation ADP)
- RPS (Recording and Presentation System)
- RPS Client (Recording and Presentation System Client)
- SGTW (Surveillance Gateway)
- MFA (Monitoring FDP Application)
- e-MAPS Suite
- Strip Printer
- Centralized **DBMS**

The **Flight Data Processing System** (FDP) is the core of the Suite, providing the following main functions:

- Flight plan and radar track acquisition.
- Flight trajectory computation and Flight progressing function
- Coordinations between sectors and Flight transfer and assumption of Control
- ATC Clearances
- Operative room configurations
- OLDI-based Ground-to-Ground coordination between boundary ATSU

All clearances and order inputs by ATCO produce flight plan updates. The updated flight plans are distributed from FDP to all controller working positions and assistant working positions.

By means of **Workstation FDP** (WS FDP) ATCO can interact with the system by inputting orders and clearances and display the flight plans in order to control and plan the traffic.

The **Traffic Update Feeder** (TUF) is the component responsible of the alignment between the two heterogeneous systems MAIN and FDPS. Once defined both the MAIN and the recovery systems, TUF replicates, from the MAIN system to the recovery one, the manual orders performed by ATCO and the automatic events related to OLDI messages (generating flight plan updates) and Airport QNH data. In this way, both MAIN and recovery systems can update independently flight plans.

The Controller Working Position (e-CWP) employs several data sources in order to provide the ATCO a full and integrated information sight that takes into consideration the contribution from both surveillance and FDP systems. Surveillance flow is provided by a multicast channel in different formats between the ones operative in Italy and the ones in Asterix standard (cat. 62). Mode S information are displayed on both radar labels and dedicated flight lists.

The **CORreLation Manager** (CORLM) establishes and maintains a unique correlation between flight plans and radar tracks, by means of SSR code for Mode A radar tracks, and by means of Callsign for Mode S radar tracks.

The **TEChnical SUPervisior** (TECSUP) supervises the state of each system in the Suite, highlighting potential fails, the state of line connection between systems and their band, the state of CPU, RAM and SWAP memories.

The **Auxiliary Data Processing System** (ADP) provides the ATC Control Centre (ACC, APP, TWR) with meteorological information and NOTAM messages, acquired automatically from specific networks (AOIS/AMIAS, AOIS/AISAS, AWOS, etc.), or manually by ACTCO's inputs, who can display/modify/insert data by means of **Workstation ADP** (WS ADP).

The **Recording and Presentation System** (RPS) records all operations performed by ATCOs to manage the flights. In particular, it records diagnostics from FDP console, flight plans in the systems and all the updates derived from manual input of ATCOs or external authority. Thanks to its HMI provided by the RPS client, the user can apply a series of filters and execute a query in order to visualize records in post-analysis and to export data recorded by RPS.

The **Surveillance Gateway** (SGTW) feeds tower systems providing surveillance data. SGTW collects surveillance data and filters them depending on environment, in order to feed different towers in the same FIR.

The **Monitoring FDP Application** (MFA) is a monitoring tool, which displays, in a graphic manner, information extracted from FDP system logs. The diagrams show the time trend of the main hardware resources and of the FDP main processes. All kind of diagrams are selectable by a toolbar.

e-MAPS SUITE is a full suite, essential for the definition of different geography environment of interest. By MAPS Suite, the user is able to define a full geography of the FDP system, according to the AIRAC documents, thanks to an HMI, a geographical DB and a file output. It is possible to display some "relevant" and "interesting" elements as defined in the FDP geography.

The **STRIP PRINTER** subsystem allows users to print, in an automatic or manual manner, departure and arrival strips of the flights, which are of interest of ACC, using a dedicated thermic printer.

The centralized DBMS guarantees data persistence in high reliability.
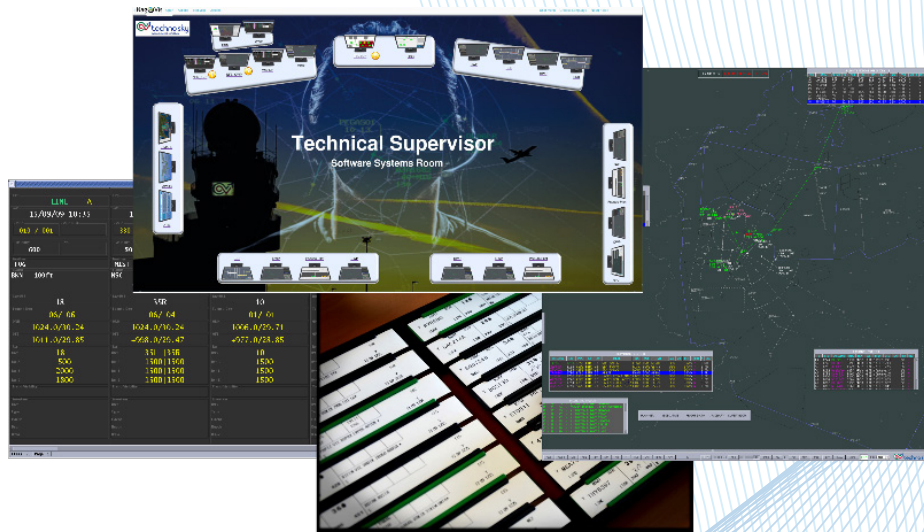
Interfaces:

- Meteorological information and NOTAM messages acquisition.
- Flight plan acquisition from CFMU via AFTN network (both ICAO and ADEXP format).
- Radar track acquisition from ARTAS system.
- Surveillance flow provided by a multicast channel in different formats between the ones operative in Italy and the ones in Asterix standard.

Technical Specifications:

- At least 1000 tracks and 1000 Flight Plans proven
- Network Redundancy and Master/Slave configuration
- Open-Source Database and Oracle interfaced
- Linux OS based workstations for clients and servers
- Failover < 20secs

Regulations and certifications:

- Developed according to ENAV Safety Management System and Security Policy
- CMMI Compliant Development Cycle
- Developed according to the Software Assurance Level (SWAL) identified during the safety assessment process
- EATMN Constituents certified by DSU (Reg. (EU) 2018/1139)

Support:

- Skilled Train-the-Trainers human resources for maintenance scope

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