e-ACC

ENAV ENR/APP ATM SUITE

Aircraft flying in a Safe Mode through the EnRoute & Approach controlled airspace

ENAV ENR/APP ATM SUITE

MISSION

e-ACC Suite implements all the features to support ATCOs in supplying Air Traffic Control Services for EnRoute and Approach airspace.

Operational scenario:

- Surveillance System Tracks display (label-based control)
- Flight Plan Lists
- Flight Plan and Surveillance tracks correlation
- ATCO input for clearances
- Flight plan 4D Flight trajectory computation and lifecycle updating
- Coordination between sectors
- OLDI-based Ground-to-Ground coordination between boundaries ATSU
- Flight transfer and assumption of Control
- Operative room configurations
- Data distributions to connected TWR ATM systems

Key benefits:

- Surveillance track acquisitions from surveillance sources or trackers in standard ASTERIX formats
- Integrated CWP with label-based stripless control paradigm
- Automatic or manual paper strip printing if needed
- Automatic 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
- Fully integrated with Techno Sky e-TWR Suite to ensure seamless coordination with TWRs
- Technical Supervision System available
- Recording of all surveillance, flight data and operations performed by ATCOs
- Simulation Platform available with the same ATCO HMIs
- Maintenance tool e-MAPS Suite included to:
  - » Create/upgrade maps with aeronautical graphic elements (SVG-Scalable Vector Graphics multi-layer maps format)
  - » Generate ATC geography for e-TWR FDPS following EUROCONTROL AIRAC Amendments
- Standard formats with third-party systems (ADEXP and FMTP)
- Standard interfaces with external systems (OLDI, AFTN, AMHS)
- User-friendly user interfaces
- SSR ORCAM (Originating Region Code Assignment Method) Rules application with local SSR codes bank
- Mode-S compliant
- Radar Labels/Flight List integrated hooking
- Safety Nets (STCA, MSAW, APM, APW)
- Medium Term Conflict Detection (MTCD)
- Safety support tools such as MONA and VERA

Main technical features and overview:

The suite comes with a minimum set of ATC tools:

- **ACC FDPS** (ACC – Flight Data Processing System)
- **CORLM** (Correlation Manager)
- **STRIP**S (Paper Strip Printing Server)
- **SGTW** (Surveillance Gateway) & FGTW (Flight Gateway)
- **SNET** (Safety Nets Server)
- **MTCD** (Medium Term Conflict Detection Server)
- **TECSUP** (Technical Supervision Server)
- **RPS** (Data Recording and Presentation)
- **ACC CWP** (Surveillance Controller Working Position HMI)
- **ACC FDO** (Flight Data Operator HMI)

ACC FDPS is the core server component in charge of the elaboration and processing of flight data for the tower sector:

- Departure, Arrival and Local Flight Plans Planning (IFR/VFR Rules, Route Decoding)
- SID/STAR Procedures
- Airport Runways Scenario
- 4D Trajectory Prediction and Progress Update (Estimated/Actual Times calculation)
- DCT Free Routes
- IFPL/ICHG/IDLA elaboration, CTOT calculation on SAM/SRM Messages
- ATC Clearance and ATC ground-based operations

CORLM is the server component in charge of handling flights correlation with surveillance tracks.

STRIPS is the server component in charge of handling paper strip printing (automatically or manually triggered).

FGTW is the server component in charge of filtering and forwarding relevant flight plans to TWRs.

SGTW is the server component in charge of filtering and forwarding relevant surveillance data to TWRs.

SNET is the server component in charge of Safety Nets service (STCA, MSAW, APM, APW) fully compliant with EUROCONTROL requirements as well as other safety support tools (MONA and VERA).

MTCD is the server component in charge of Medium Term Conflict Detection service (MTCD) fully compliant with EUROCONTROL requirements.

TECSUP is the server component in charge of system technical supervision (SNMP and nagios based)

RPS is the component in charge of flight and track data recording and allows to reinject data to a CWP to start an interactive replay session. It has a dedicated HMI to perform queries and generate reports.

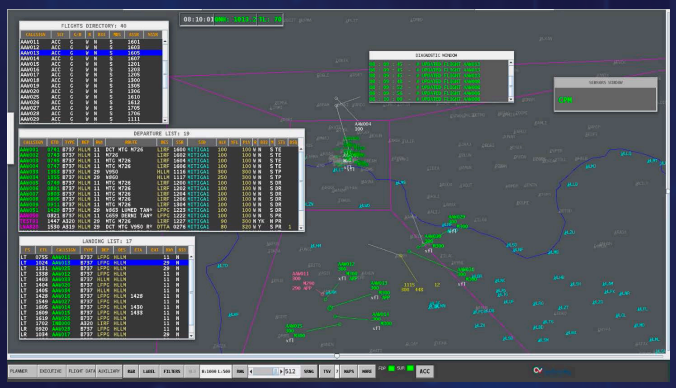
FALLBACK deployment

- It can be deployed as a FALLBACK system to a dissimilar main one, in order to guarantee the operational continuity in case of failure in the MAIN system, avoiding the “common mode of failure”
- Continuous flight and environment data with main to ensure operation readiness
- Built with the same components of the full e-ACC Suite, can act as a primary system indefinitely
- Can be deployed with minimal set of functionalities but also enhanced with safety and support tools
- Custom HMIs can be developed to reflect the MAIN system

Clients HMIs

ACC CWP (Surveillance Controller Working Position HMI) is the HMI designed for the Air Traffic Controller dedicated to EnRoute/Approach Traffic Management. Its flexibility allows the integration of multiple data sources, and changes of configuration based on the destination environment, and based on the interaction needed with the FDP system.

Significant Flight Data received from TWR FDPS are represented on configurable Radar Tracks labels shown on the map to identify aircraft in the local Area of Responsibility. Flights can be also shown in configurable list formats docked beside the surveillance display or floating. Data shown on radar labels are immediately accessible to the ATCO through mouse clicking, shortcuts to customized orders and functions can be properly configured on labels to make the operations seamless. Each e-CWP can have its ATC role with dedicated functions.



ACC FDO (Flight Data Operator HMI) is based on a long-lasting study dedicated to well arrange flights lists into a monitor of whatever resolution according to users’ HMI requirements. Layout, Colors, Fonts, Size, ATC Menu, Toolbars and Warning Functions, related to any flight data changes relevant to the ATCO operations, can be adapted to the user’s needs. Paper-strip printing is provided on request and when automatic events occur. Lists can be adapted in size and dimensions, order criteria of flights in each list are configurable.

Each e-ACC HMI is the result of many years of expertise and a strict collaboration with the Italian Air Navigation Service Provider (ENAV). All our HMIs are highly configurable:

- Customizable Layouts, Colors, Fonts, Size, ATC Menu, Maps, Radar Label, Toolbars and Warnings
- Paper-strip printing on request and /or when automatic events occur
- Flights List and Radar displays well-combined on e-CWP (docked and/or floating)
- Customizable shortcuts to ATC orders from radar labels
- Overlapping Layers of maps to identify the right Area Of Responsibility on e-CWP
- High Configurability of screen layout, to provide different data views
- Multiple ATCO Roles configurable and easily switchable (e.g. Executive, Planner, Supervisor)

Interfaces:

- Surveillance data standard formats from single sensors of fused system tracks from SDPS (ASTERIX CAT001, CAT002, CAT021, CAT023, CAT034, CAT048, CAT062, CAT063, CAT065)
- Flight Plan standard interface AFTN and/ or AMHS X.400 (IFPL/EOBT update for Flow Restriction according to Slot Allocation Messaging)
- OLDI protocol for co-ordination and transfer of current flight data between adjacent ATSUs
- International ICAO and EUROCONTROL ADEXP and FMTP Standards compliant
- e-TWR Suite integration

Technical Specification:

- 1000 tracks and 1000 Flight Plans proven
- Cluster failover configuration
- Seamless network redundancy at switch and host level
- Open-Source Database
- Enterprise Linux OS based servers and workstations
- Physical, virtualized or mixed deployment
- Failover < 20secs (worst case)

Regulations and certifications:

- EATMN Equipment compliant with Reg.(EU) 2018/1139
- Supporting ANSPs for SoC emission in compliance with Reg.(EU) 2017/373
- CMMI-DEV Level 2 (V.3.0) compliant development cycle
- Software Assurance Level (SWAL) according to EUROCAE ED-153
- Secure Development process compliant with EUROCAE ED-205A

Support:

- Train-the-Trainers service for user and technical topics
- System Remote monitoring and maintenance
- Ad-hoc prototyping to meet customer's operational requirements

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