SKYSOFT

SKYSOFT SERVICIOS S.A.

AIR TRAFFIC MANAGEMENT CONSOLE

SKS-ATM

Av. Cabildo 4769, Piso 2 (C1429ABF) – C.A.B.A., Argentina
Tel.: +54 11 4703 2599 - Fax: +54 11 4704 7762
info@skysoftservicios.com

SKYSOFT SERVICIOS S.A.

INTRODUCTION

Operational requirements have driven **Skysoft Servicios** to introduce a new product that helps modernize Air Traffic Control Towers of those aerodromes that are looking for greater security, operational advantages and efficiency: the **AIR TRAFFIC MANAGEMENT CONSOLE (SKS-ATM).**

Skysoft Servicios detected operational needs and possible improvements for the processes and technologies being used in the control towers. Digitalization enables an improvement in the manipulation, logging and validation of the information related to control tower Flight Plans.

THE PROBLEM

Current aviation practices regarding flight strips use paper strips which are completed manually, with part of the data being logged in Control Books that are later used for airport/airfield control and statistics. This manual approach makes everything more cumbersome and slower, with less flexibility and more room for error when processing the information. In an industry that is as complex and in continuous development, having access to information as well as interconnection between systems in a timely manner is crucial.

With electronic flight strips, new levels of security, data validation, reliable statistics, speed of access and information transfer between systems/areas are possible. The Air Traffic Management Console workstation can have access to all the necessary information required for efficient air traffic control, NOTAM, OPMET, meteorological data, flight plan access, instant access to the AMHS network, air navigation charts, and for isolated airfields, local light control, video camera control, IPM messages, electronic AIP and other accessories.

THE SOLUTION

Skysoft Servicios has developed a system that enables the digitalization of flight strips and has many other features.

It is a high precision software tool, complete and integrated into the information management systems. This is a solution that aims at coordinating, administering and representing the various sources of data automatically (meteorological, flight plans, AIS and more), all from a single easy to use graphic workstation.

Each system's workstation has automatic access to all the key information for efficient control, based on data arriving from multiple sources and data banks, meteorological, flight plans, AIS and others, including real time viewing of runways in use as well as the queue of ready for take-off aircraft.

The information that can be available for display on the workstation's screen includes:

- Air navigation charts.
- Real time video images of the runway headers.
- Electronic flight strips for all airfield aircraft activity.
- Complementary aeronautical information.

SKYSOFT SERVICIOS S.A.

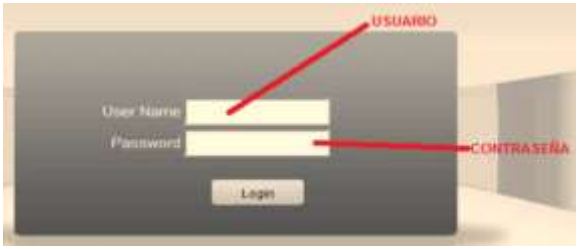
A) User registration

Access to the Air Traffic Management Console workstation is protected by the use of user identification and passwords, added to this there are three levels/roles of operation/supervision controlling each user level of access.

User access levels:

- End user: operational staff, Air Traffic Controller.
- Supervisor: supervisor in charge of airfield Air Traffic Control.
- Administrator: engineer or technician responsible for correct system operation.

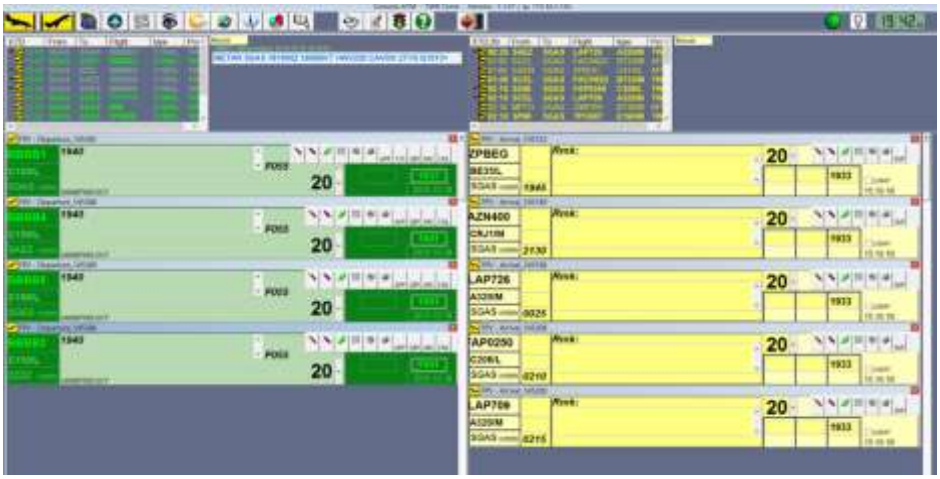
The Administrator is responsible for the configuration of each user workstation according to the specific airfield requirements.



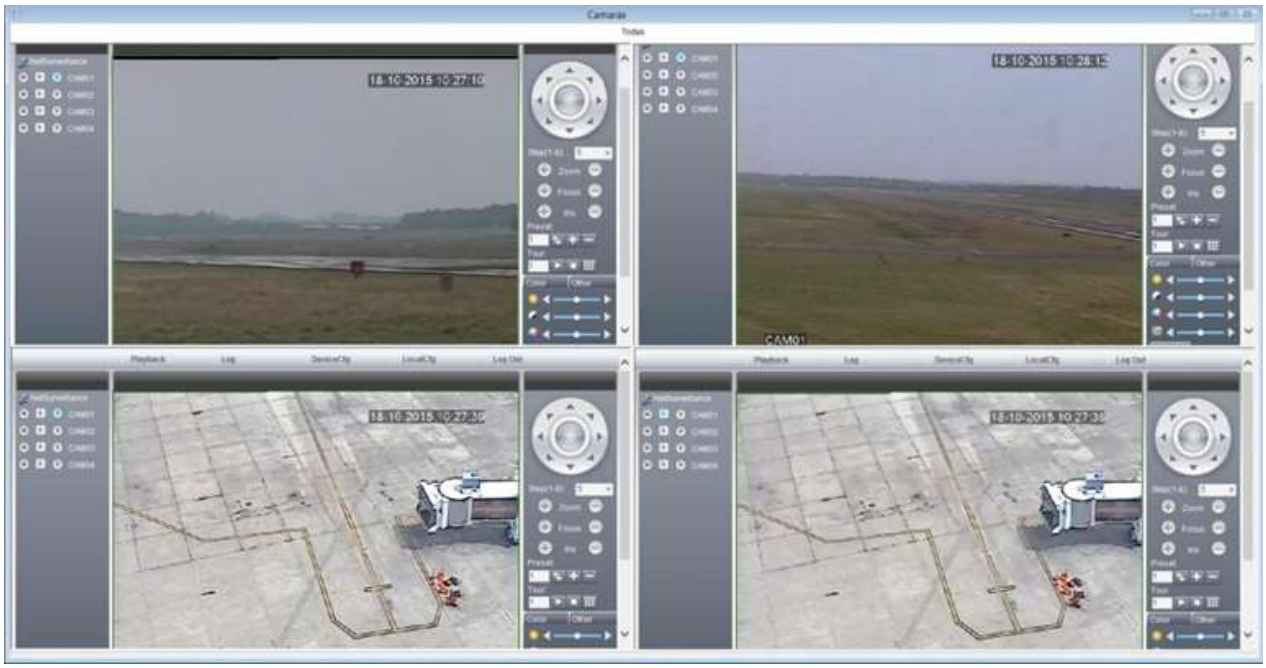
B) Information display

The workstation screen can show:

- Air navigation charts.
- Electronic flight strips for all aerodrome aircraft activity. These are generated based on active flight plans and can be displayed in order by using mouse, keyboard or touch control.
- Active flights, based on the flight plans that are loaded in the data bank, giving access to the flights to be controlled, with parallel monitoring possible by other aerodromes involved in specific aircraft's maneuvers.
- Complementary aeronautical information.



- Real time video images of the runway header, where cameras are installed. The cameras can have pan/tilt/zoom capabilities with high off the ground installation, on the Control Tower, for complete and permanent obstruction and “on runway” event monitoring that may put at risk aircraft operations.



C) Integration with other systems

The Air Traffic Management Console communicates with other systems via AMHS (X.400) messaging and/or via Web Services, for which a TCP/IP network link between aerodromes is required. In emergency situations, alternative links may be used, when no WAN connectivity is available.

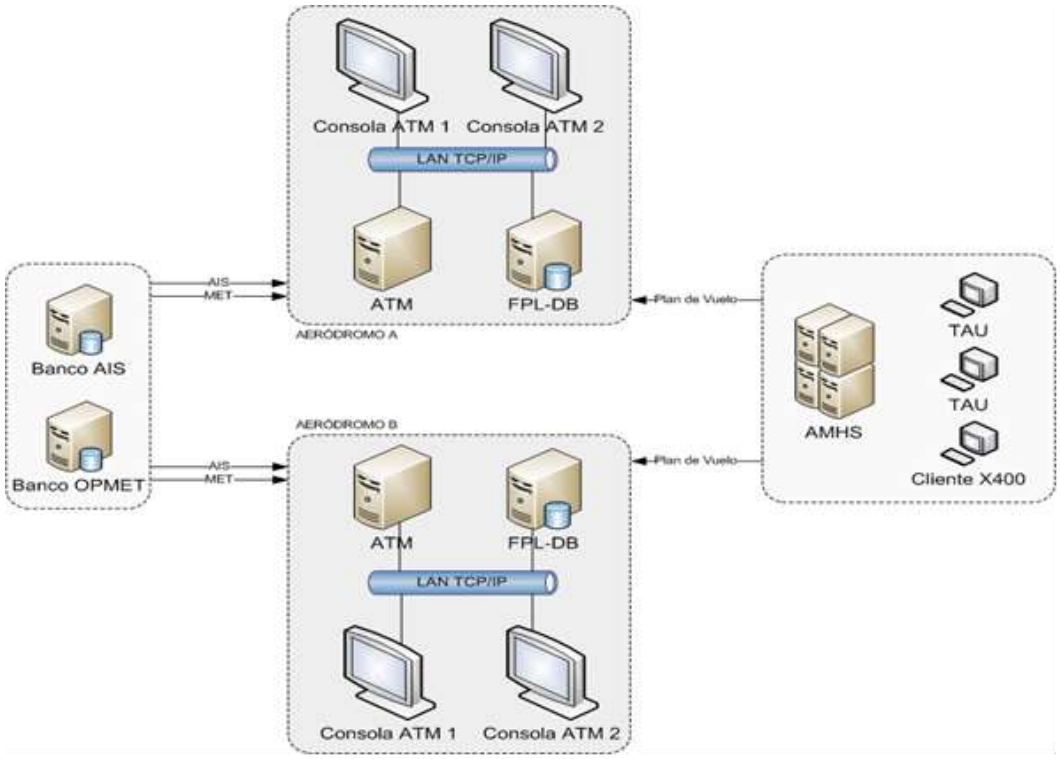
The system’s workstation can interact with the following systems:

- DBAIS (NOTAM) data Bank.
- OPMET (meteorological) data Bank.
- FPL-DB (flight plan) data Bank.

Each aerodrome has access to the Flight Plan Data bank (FPL-DB), an applications server and via a TCP/IP network to the AIS and OPMET data Banks. Additionally, the Flight Plan data bank and the message register (ATM-REQ-10) carry out an automatic daily backup process.

The real-time meteorological (MET) and AIS information is linked to the electronic flight strips, showing the controllers these messages.

All flight plan messages are registered and validated by the AMHS system, in the same way that all modifications and updates for one same flight plan are processed.



D) AMHS.

The **SKS-ATM** system provides ample support for the AMHS X.400 protocols, including 1984, 1988 and 1992 versions of this standard. Primary support is for the Message Transfer Protocol x.400 (P1), this protocol interconnects Message Transfer Agents X.400 (MTA) as well as P3 and P7 protocols which enables the link to Message Stores and other Clients (users).

E) Statistics reporting

The user can view and/or print the flight plan in use, enabling signature for any legal presentation requirement.

SKYSOFT SERVICIOS S.A.

F) Availability

The System is kept available (with reduced functionality) even when all connectivity to other airfields is limited or non-existent. Workstation operation is dynamic, with immediate response to user requests or requirements.

ADVANTAGES

SKS-ATM is a technologically secure system that enables Flight Plan Management using a digital interface, assisting in Control Tower Operations.

- It offers a backup to all aircraft operations carried out in airports.
- It assures a redundant connection of the Control Tower position with all required information for operational performance.
- It enables modular growth with no limitations.
- The workstation interface man-machine is viewable and interactive.
- It enables flight coordination between aerodromes.
- It enables electronic flight strip management, with automatic monitoring and archive.
- It enables electronic flight strip printing.
- It enables AMHS messaging (FPL, MET, AIS) and archive.
- It enables registration and validation of flight plans.
- It enables the creation of AMHS flight plans.
- It enables remote daylight and nighttime camera monitoring, with zoom controls.
- It is a High Availability System.
- It can be installed an operated in both Windows and Linux environments.
- The user interface enables AMHS IPM free text message creation and posting for emergencies.
- It is a graphic workstation from which flight plans can be created, modified or cancelled.
- It manages repetitive flight plans (RPL)
- It enables creation of PDF documents and AMHS messages in accordance with appendix 2 of ICAO document 4444 ATM/501 and its modifications.

The **SKS-ATM** system is developed in accordance with state-of-the-art engineering software practices with strong emphasis on:

- Reliability.
- Robustness.
- User friendliness.
- Accuracy

BACKGROUND

Skysoft Servicios started the **SKS-ATM** system development in 2014, since then, based on system usage, updates and improvements have been done, now enabling the offering of a mature and productive operational system.

The **SKS-ATM** system has been in successful operation in Paraguay since 2016, with DINAC supporting the continued development of their installed equipment.

CONCLUSIONS

The **SKS-ATM** is a technologically advanced operational option that improves Flight Strip and information management, avoiding errors and simplifying registration and auditing of these.

Skysoft Servicios developed this system to facilitate the job of Control Tower Operation. With “in the field” service, it has shown that a complete “situation” picture can be seen at any time, improving operator “self-awareness”.

Interconnecting with other software systems, secure messaging systems and aeronautical data banks, the **SKS-ATM** Console represents yet another step towards operational digitalization.

Skysoft Servicios S.A. is an Argentine company ISO 9001:2015 certified for its developments. Our commitment to operational and technological quality are second to none. That is why we seek that all services offered by the **SKS-ATM** cover all the operational requirements as defined by ICAO Doc. 4444 Procedures for Air Navigation Services: Air Traffic Management, International Standards and Recommended Practices Annex 11 and its amendments (Air Traffic Management), 9426 (Air Traffic Planning Services Manual) and 9476 (Ground Control Movement and Systems Guidance Manual), as well as the AFIS Eurocontrol Manual.