

MODERNIZATION OF THE VCS INFRASTRUCTURE

Abstract

The case study described hereafter shows the capability and flexibility of SITTI systems to respond to challenging requirements in a complex nationwide network, providing the customer with top-edge performance and reliability.

Customer

ENAV, the Italian ANSP
www.enaav.it



Business Requirement

ENAV has always been a major actor in the definition and implementation of the latest standards for Air Traffic Management and Air Traffic Control. The undoubted benefits of the Voice over IP (VoIP) technology over other types of communication are pushing all ANSPs to move in the direction of a significant modernisation of their VCSs at all airports and ACCs. In this frame, ENAV designed a large project for the upgrade of more than 40 sites, aimed at the introduction of fully ED137 standard compliant VoIP features in all VCSs in their network.

SITTI Solution

SITTI is a primary leader in the development and installation of Voice Communication Systems (VCS) worldwide through its consolidated MULTIFONO® M800IP® family. The systems belonging to this products family are natively VoIP ED137 compliant and therefore fully adherent to the requirements set by the customer.

Main Benefits to the Customer

The long experience acquired by SITTI in the provision of large nationwide systems in several countries in the world is put at full disposal to the customer.

The MULTIFONO® M800IP® family VCS selected for this project is not only natively capable of dealing with VOIP streams, but it also integrates analogue, digital, legacy radio and telephone communications.

- ✓ Full ED137 standard compliance
- ✓ Reduced maintenance costs
- ✓ 24-7-365 availability
- ✓ No SPOF (Single Point Of Failure)
- ✓ Easy expandability
- ✓ Improved efficiency and safety



Voice Over IP (VOIP)

As a matter of fact, the IP technology is increasingly influencing our life in daily activities, thanks to the capability of conveying many different types of information streams on a common infrastructure. The convergence of voice and data onto one multimedia network pushed ANSPs to consider the adoption of new technological solutions to gradually move away from old-fashioned analogue links and digital circuits towards a common, widespread, cheaper approach to communications, in order to better cope with their tasks.



Numerous converging aspects concurred in paving the way to the transition to IP, among which more powerful processing machines, faster networks, decrease of IP elements maintenance costs, development of new standards and protocols, easy products availability on the market, obsolescence of legacy connections, etc.

The advantage of such an approach is clear: reduced costs, easy maintenance, fast fault repair, automatic rerouting in case of unavailability, unprecedented flexible configuration features, rapidity in the deployment, lower staff training needs, etc. All this can be summed up into one word that is the leading driver for most decisions: cost effectiveness.

MULTIFONO® M800IP®

The M800IP® Voice Communication System represents SITTI state of the art top level Voice Over IP (VoIP) system. It fully meets Air Traffic Control requirements by integrating the most advanced IP features and technologies, coupled with user-friendliness at all Operator and Maintenance levels.

SITTI boasts a long-term presence in international standardisation Working Groups tasked with the introduction and development of IP technology into the ATC environment. Such strict collaboration and proactive contribution enable the M800IP® VCS products to fully comply to ICAO, EUROCONTROL and EUROCAE worldwide Recommendations and Standards

The M800IP® MULTIFONO® VCS brings with it the required flexibility to fulfil all user requirements and to support multiple operational roles and usages. Specifically, M800IP® is fully VoIP ED137 compliant, as testified by the many successful interoperability trials in both Europe and USA, as well as the in-service operations of M800IP® around the globe. Digital, analogue and legacy non-IP interfaces are natively integrated.

The overall system Open Architecture design ensures high level of modularity, scalability and process distribution. Through these principles an unparalleled Reliability Ratio of 99.9999% is achievable.

Continuous functioning without single-point-of-failure is guaranteed through the use of Duplicated and Parallel processor operations, Star Architecture and distributed subunits, thus ensuring fault tolerant operations. These features make M800IP® MULTIFONO® VCS the best choice for strategic Civil and Military mission critical Communication applications using VoIP technology.

Scalability and Independent Subunits allow the M800IP® MULTIFONO® VCS to be configured to meet the requirements of small airfield control towers up to full scale Air Traffic Control ACC centres around the globe, with hundreds of Controller Working Positions (CWP), radios and telephone lines, without sacrificing system performance.

Operational seamless expandability grants the customer an optimal level of flexibility to meet changing ATC requirements and needs that guarantee an enviable investment return.

M800IP® takes full advantage of the previous TDM MULTIFONO® systems that were originally present at the customer premises. The customer, in fact, is now in the position of taking full advantage of the migration to VOIP (especially in terms of transport media and radio equipment), without losing the capabilities and functionalities provided by the current radio and telephone devices, thus ending up in a significant return-of-investment and reduced maintenance costs.



ENAV Project

In order to properly phase the introduction of the new VOIP technology, ENAV decided to issue a tender for the definition of a Frame Contract that would allow the customer to gradually acquire the systems according to their needs and internal schedule.

The Frame Contract is aimed at addressing all airports operating in Italy, both in their Main and Emergency configuration.

Each airport site has its own characteristics and specific needs that have been taken into consideration while discussing the contract with ENAV, so that this latter can ask SITTI to provide the solution elements that best suit the local requirements e.g. in terms of communication interfaces and controller working positions.

This gives ENAV the freedom to span their modernization process over a longer period of time, without losing the possibility of implementing the upgrade steps according to their internal programs and schedules.

Whenever ENAV decides to start with the upgrade of a specific national or international airport in Italy, a specific executive proposal is being submitted by SITTI for ultimate ENAV approval.

Such technical proposal takes into consideration on one side the current radio and telephone connections at the designated site and on the other side the best solution elements (in terms of hardware and software modules) to fully support those interfaces and to provide additional standard VOIP features in full compliance with the latest national and international standards and recommendations.

Running the project

At the time this case study document is being written, ENAV has already ordered SITTI the provision of several system in the frame of the contract. These are all main systems for the following airports:

- Milano Malpensa International Airport
- Milano Linate International Airport
- Rome Fiumicino International Airport
- Bologna “Guglielmo Marconi”
- Genova “Cristoforo Colombo”
- Brescia “Gabriele D’Annunzio”
- Rimini “Federico Fellini”
- Treviso “Antonio Canova”

Two other VCS Systems for mobile towers have been commissioned and will be operational by mid 2021. A large number of radio and telephone connections have been migrated to the new M800IP® systems, thus significantly improving the overall signal quality and capability of managing devices of different kinds (analogue, digital, VOIP).

The equipment installed up to now proved their full compliance to the customer requirements and international standards, thus confirming M800IP® as the right choice for the migration to VOIP in the ATC field.

- ✓ More than 50 CWP
- ✓ 55 radio interface boards
- ✓ About 100 telephone interface boards
- ✓ Interface to the recording systems



Added value features

The VCS solution systems supplied by SITTI ensure ENAV the continuous availability and reliability of significant features that allow them to provide airlines with a top edge service. This is obtained thanks to the superior native characteristics of the devices being installed, among which:

- ✓ Non - Blocking, Open Architecture
- ✓ Extremely High Modularity
- ✓ Duplicated, Independent and Parallel VoIP star configuration
- ✓ Fault Tolerant Operation, No Single Point of Failure
- ✓ Gateway for legacy non-IP links
- ✓ User-friendly Touch Screen Terminals (MTS) with graphic interface
- ✓ CWP access to Telephone Lines and Radio Frequencies through analogue, digital or VoIP interfaces
- ✓ Best Signal Selection (BSS)
- ✓ Delay compensation

