TELERAD
Aeronautical and Maritime Radiocommunication Systems

COMMUNICATION

DECEMBER 2020

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Our goal: Total connectivity!

At a time when SpaceX is pursuing the launch to orbit of its "Starlink" constellation, where the high data rate Internet 5G and Internet of Things is in the news, the demand for data transmission is expanding exponentially. Technological innovation gives birth to more efficient launch vehicles, the miniaturization of electronics is leading to lighter and lighter satellites, reducing launch-to-orbit costs. So many technological innovations, means of communication, for interconnecting systems in the service of applications and users. In this context, satellite communications are beginning to supplement earth-bound wired and radio-wave systems. Initially intended for long-range telephony and television, the issue has become more global with satellite telecommunications providing total connectivity in the most far-flung areas on the planet. In particular in the maritime and aerospace fields, communications can nowadays be achieved without discontinuity and at an economically acceptable cost, as in the IRIS program of the European Space Agency (ESA) (see: TELERAD Newsletter, December 2018 and the Interview with Magali Vaissiere LINK)
Satellite communications are also becoming key in external military operations (OPEX) providing access via radios such as TELERAD transceivers - Series TRX9000 integrating a convergence interface for satellite links (See Focus section of the TELERAD newsletter of December 2018 LINK)
Finally, in another area, that of Europe and defense, we are pleased to welcome, Jiří Šedivý, Executive Director of the European Defense Agency (EDA) to tell us in particular about government satellite communications.

Patrice Mariotte
CEO of TELERAD

Three questions for: Jiří Šedivý

Executive Director of the European Defense Agency (EDA)

EUROPEAN DEFENCE AGENCY

Can you tell us about the EDA and its principal missions?

The Agency was created in 2004 to support and facilitate defense cooperation in Europe. Over the years, it has become a European platform that allows our 26 EU member states, with the exception of Denmark, to jointly develop their defense capacities if they so desire. Small and flexible, the Agency works "à la carte": The Member States can choose whether or not to participate in projects on a case-by-case basis. The EDA currently manages over 100 programs and projects dedicated to research and to capacities and more than 200 other activities related to the development of capacities, research and technology (R&T) and the defense industry. Furthermore, EDA collaborates closely with the European defense industry to improve our technological and industrial defense base in Europe and to help make this industry stronger and more competitive. We are also the "Military Voice" with the European Commission and the EU agencies and act as a military interface to best implement EU policy in general for the benefit of defense. The Agency is also highly involved in acting through new defense cooperation instruments that the EU has equipped itself with over the last few years, in particular the Coordinated Annual Review on Defense (CARD), the Permanent Structured Cooperation (PESCO) and the European Defense Fund (EDF).

What is the role of the Agency in the Single European Sky (SES) program?

The role of the Agency in the Single European Sky program fits in perfectly with its mission of interfacing with the European Commission in terms of the Union's policies having implications in the area of defense. Within this project, the Agency in fact, facilitates the coordination of military visions, with the goal of seeking common ground that its then relays to the European Commission and all the European organizations and agencies involved in the Single European Sky program. Military and civil aviation permanently share a common air space and this creates a real sense of interdependence. Technical, organizational and conceptual developments which take place in the civil aviation world in the framework of this program, can have very significant effects therefore, on military aviation and consequently on the defense and security missions entrusted to it. These effects are of an operational and financial nature and hence influence capacity. In the development and deployment of the Single European Sky program, the role confided in the Agency is therefore, to create an essential balance between economic needs and defense and security. Effective defense and security in Europe contribute in fact to the development of the civil aviation sector as well as to reinforcing passenger confidence.

What are the structural programs in the area of government satellite communications?

Government satellite communications (GOVSATCOM) are essential for defense, security, humanitarian aid, emergency interventions and diplomatic communications. They are a key catalyst for civilian missions and for military missions/operations. GOVSATCOMs have been designated in 2013 by the European Council as one of the four flagship capacity programs of the Agency which has been given the mandate to prepare the ground for the next generation of satellite communications between now and 2025. The goal is to demonstrate the advantages of a European approach and to provide the Member States and stakeholders in the EU's Common Security and Defense Policy (CSDP), with access to a pooled GOVSATCOM capacity. In collaboration with our Member States, the EDA therefore, has developed the demonstration project "EDA GOVSATCOM Pooling & Sharing" which is now ready to meet the GOVSATCOM demands of Member States and European stakeholders in the CSDP, by means of the pooled capacity provided by contributing countries. This pooled government capacity can provide services that cannot be obtained on the commercial market with a sufficient level of access and guaranteed security. This tool provides a real answer to an existing need and is fully in line with the capacity priorities of the EU, as defined in 2018. In addition, the Agency in 2012, already launched the "EU SATCOM Market" project which, upon request, procures and provides Member States and EU CSDP operations, with services already available on the market.

With products and systems in more than sixty countries, TELERAD is specialized in the study, the development and the manufacture of radio systems used for the control of aerial and maritime navigation. A unique company in this area, it is a key player in the French and European defense, industrial and technological base.

NEWS

DGAC (The French Civil Aviation Authority): Operational readiness management market for radio equipment and navigation aids

The Technical and Innovation Directorate (DTI) of the French aerial navigation services launched an open Call for Tenders for the operational readiness management of "legacy" equipment used for VHF radio coverage and radio beacons on the French territory (Metropolitan France and Overseas territories). TELERAD has been awarded this five-year contract that will allow the DTI to ensure service continuity in parallel, with the deployment of the latest generation of TELERAD radios.

Improvement of military radio coverage in Indonesia

The Indonesian air force has awarded TELERAD a contract for the turn-key supply of two systems with different specifications – radio characteristics (VHF, UHF) and technologies (VoIP, coupling) – designed, manufactured and tested in TELERAD's premises in France. The installation and commissioning have been performed in collaboration with TELERAD's local partner.

Ultra-Marines Stations: the sun never sets on territories covered by TELERAD radios!

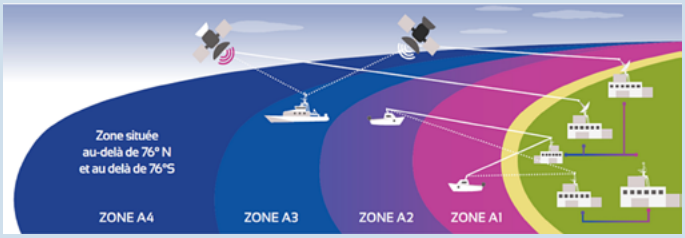
In the framework of the refurbishment of VHF coverage and change to VoIP of ten radio sites in French Polynesia and seven stations in New Caledonia, TELERAD has supplied radio systems in conformance with the specificities of French Civil Aviation (see: Focus of the TELERAD Newsletter of June 2018 concerning the "Process of software development for critical applications" LINK) especially in terms of operational availability. The geographical coverage of this project is the equivalent of an area extending from the headlands of Brittany to the shores of the Black Sea and from Oslo to Sardinia.

FOCUS

Safety at sea and maritime communications: from the international standard to a "turn-key" solution

The Global Maritime Distress and Safety System (GMDSS) is an international system using telecommunication means for search and rescue at sea and the prevention of maritime accidents. This system allows all ships so equipped and wherever they may be, to contact land-based authorities (the CROSS in France, the Coast Guard in the United States) and provides communications essential to their safety and that of nearby ships.

Four ocean areas have been defined for this. They correspond to coverage by different radio means used:



ZONE A1	Coverage from at least one VHF* coastal station with a radio range of 20 to 30 miles from the coast.
ZONE A2	Coverage from at least one MF* coastal station with a radio range of 150 to 300 miles.
ZONE A3	Inmarsat satellite coverage between the 76°N and 76°S parallels
ZONE A4	Polar zones with HF and Cospas-Sarsat radio-beacon coverage.

*Two modes of transmission are possible with VHF in zone A1 :

– Voice analog transmission by selection of the appropriate VHF channel (e.g. channel 16)

– Automatic digital transmission of encoded messages by Digital Selective Call (DSC), channel 70.

For the coverage of the zone A1, TELERAD offers a turn-key solution for the Coastal VHF GMDSS "integrated" station intended to be installed in a network along a coast. This solution will allow rescue services to be quickly alerted in case of emergencies and search and rescue operations to be launched.

The station is composed of:

- Four "single-channel" transmitter-receivers with cavity filters, intended for missions requiring high quality and rate of availability (24/7):
  - Channel 16: emergency calls.
  - Channel 70: D.S.C. for distress messages.
  - S.A.R Channel: Search and Rescue.
  - M.S.I Channel: Maritime Safety Information.
- A "multi-channel" transmitter-receiver for more sporadic use missions such as calling harbor pilot services or military authorities.

The antenna system associated with each station is optimized by reducing the number of antennas to just three:

- For "reception", the use of an active multi-coupler allows a single transmitting antenna to be connected to four "single-channel" equipment items instead of four in the classic solution.
- For the transmission part, cavity filters allow just one transmitting antenna to be connected for the other "single-channel" equipment items instead of four in the classic solution.
- A transmitting antenna dedicated to the multi-channel system.

The reduction in the number of antennas allows better decoupling to be ensured between them (See: The Focus of the TELERAD Newsletter of December 2016 concerning "Radio cohabitation" LINK) and for them to be easily adapted to available locations on existing pylons.

In addition, the station incorporates an Automatic Identification System (AIS) receiver allowing traffic to be monitored in real-time.

To face up to the growing demand for data (data-rate/volume), the International Maritime Organization (IMO) has initiated a future VDES (VHF Data Exchange System) project and has asked its members of the ecosystem, including TELERAD, to work on this development.

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