THWINCOM (THales Wireless Naval COMmunication) is a product line of wireless systems that enables the crew on board naval vessels and in particular the Damage Control & Fire Fighting Team to communicate ship wide avoiding interruption at any time. A specific platform designed hardware infrastructure consisting mainly of base stations, controllers, antennas, dispatcher workstations and fixed/mobile voice terminals guarantees a lossless communication by means of ‘handover’ capabilities (from radio cell to radio cell).

RF equipment and an IT infrastructure build the functional core of the system and provides communication services to the operators. The RF equipment provides e.g. for a TETRA radio network with full coverage across all the accessible areas of the entire platform in order to give the operators the possibility to communicate while roaming around.

TES Thales Electronic Systems

Thales Wireless Naval Communication Systems

The used hardware is exclusive COTS based. It is also applied in civil market using certified standards as TETRA (Terrestrial Trunked Radio). The same components have been used also for many land based applications with mobility and security requirements.
THWINCOM
System Concept for Naval Applications

HOW THE SYSTEM WORKS
The wireless communication system consists of RF equipment and an IT infrastructure. The latter builds the functional core of the system and provides communication services to the operators. The RF equipment provides e.g. for a TETRA radio network with full coverage across all accessible areas of the entire platform in order to give the operators the possibility to communicate while roaming around.

In order to respect the ships separation into damage control areas the infrastructure is divided into several areas. Each damage control area is supplied primarily by its own radio cells and secondary by the other radio cells which provides for sufficient redundancy in case of emergency.

The RF coverage onboard is ensured either by means of using whip antennas or leaky feeder cables where ever possible. In some areas the installation of flat panel antennas (circular polarized) may be an exclusive alternative.

The THWINCOM systems which are based on TETRA technology provide for several communication services, such as individual, group and data communication. They will be configured considering exactly what is required for the missions with the possibility to adapt the configuration related to sudden special missions.

Regarding these missions, groups can be setup dynamically or existing communication groups can be merged together in order to reach the best performance related to the communication needs dedicated to the different teams.

WHAT THE SYSTEM PROVIDES
• Ship wide wireless voice and data communication services
• Individual-, group- and emergency-call
• Dynamic groups / group merging
• Half- and full-duplex communication
• High reliability and high performance fall-back modes
• Secured / encrypted voice & data (on request)
• Ruggedized and compact equipment
• Modular design / standard interfaces
• Remote control & system monitoring
• Digital Voice / Call data recording

HOW THE SYSTEM IS MANAGED
The peripheral management of the wireless communication system is an important feature for mission critical purposes like damage control & fire fighting. A fire can start anywhere at any time onboard a ship, hence a single central management station would be a single point of failure with dangerous consequences. For the Thales system this has been taken into account in the concept of the radio cells and IP voice terminals by means of a distributed management system.

Each radio cell can be administrated not only by the central management console, e.g. each TETRA base station can be switched off remotely, but from any management client connected to the system, e.g. mobile dispatcher, network management server or technical workstation.

The system and subscriber databases are periodically distributed from the network management server to the base station controllers, IP voice terminals and gateways in order to stay operational even if the central network management server is out of order.
THE DISPATCHER WORKSTATION
One item of the wireless communication system, the 'Dispatcher Workstation', provides access to all active communication including their current connection parameters as a 'first among peers' user. Thus, the current situation about the systems capacity utilization and workload can be monitored online. This includes the activation and termination of calls; activation of emergency calls to one or multiple subscribers or to one or many groups as well as calls to all registered subscribers at once.
Further the dispatcher can setup and reset dynamic groups and merge existing groups in operation without any re-configuration. The short data service (SDS) is provided by the dispatcher workstation as well as sending and receiving of status messages.
Finally the Dispatcher can administrate and use different user profiles and roles with specific access rights. The dispatcher workstation is available for 19 inch cabinet integration, desktop variant and mobile, by means of a ruggedized toughbook.

SELF-CONTAINED MOBILE RADIO NETWORK
The compact and modular design of the THWINCOM system components is expressed demonstratively in the ruggedized self-contained TETRA base station as depicted above.
This container incorporates a 4-carrier TETRA base station providing up to 31 traffic channels (with one control channel). The 50 Ohm RF coupling network is integrated as well as two base station controllers (in a master/slave setup) incl. two redundant power supplies. Finally the container also houses the network management server hosting the subscriber and system databases and the IP switching components.
This solution is designed specifically for civilian units and for military detachments to meet the requirements for military missions, humanitarian operations, crisis management and peace-keeping missions.
This system can be set up quickly to facilitate the mission, deployment and coordination of emergency services under any type of incident.
THE WIRELESS COMMUNICATION SERVICES
The communication services provided by the TETRA infrastructure are based on standard IP technology connecting the core components by means of ToIP (TETRA over IP).
Handheld transceiver, IP voice terminal and dispatcher operators can communicate by using private calls, group calls and short data messages. The operators are connected to other shipboard communication systems via standard analog and digital interfaces (AF, VoIP, E1 etc.). Handheld transceivers can register to the infrastructure (Trunked Mode TMO) and directly by using the mobile-to-mobile communication service (Direct Mode DMO).

THE SYSTEMS SOFTWARE APPLICATIONS
The communication services are managed by several innovative software applications.
Subscriber database management, dispatcher functionality, call recording, gateway services and IP voice terminal are just a few examples of tasks managed by these applications.
Intuitive and easy to learn MS windows™ based dialogs, background services and forms build the human-machine-interface (HMI) between the state-of-the-art hardware (RF & IT components) and the critical missions and every-day-use purposes to be supported by the wireless system as provided by THWINCOM for local compartments and ship wide use.

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