SECURITY SYSTEMS

MARITIME SURVEILLANCE SYSTEM

In security you cannot choose the second best option

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MARITIME SURVEILLANCE SYSTEM

A sophisticated border surveillance system for coastal and terrestrial supervision

Introduction

Indra designs, builds and integrates state-of-the-art border surveillance systems for coastal and terrestrial supervision.

These systems can be integrated with existing systems and networks to improve detection and coordination performances.

The SIVE system

The SIVE is a sophisticated border surveillance system providing command and control capabilities and integrating state-of-the-art technologies in radar and optronic systems.

The SIVE system consists of a single or multiple Command and Control Centers (CCC) and a set of Sensor Stations (SS) forming a hierarchical architecture.

The sensor stations are deployed across the surveillance area and can be adapted for ground or coastal surveillance and can incorporate fixed or mobile sensor stations.

Applications

The SIVE system is specialized in:
- Detection of small boats
- Detection of moving people or vehicles
- Coordination of interception units
- 24h /365d operation (day and night)

Therefore, it is the ideal solution for:
- Protect the country's borders against:
  - Terrorism / Piracy
  - Illegal immigration
  - Drug Trakicking / Contraband
  - Illegal Fishing
- Guarantee sea traffic safety within its waters, coasts and ports
- Protect strategic off-shore installations – oil platforms especially
- Control its waters to prevent environmental disasters and act accordingly in case these take place

Main system features

The main SIVE system features are:

Modular design
- Scalability: the number of sensor stations can grow up easily
- Sensor independent design: any commercial type of radar/optronic sensor can be integrated

Centralized operation
- Hierarchical design of CCC: The information from several Regional CCC can be centralized in a National CCC
- Remote control of sensor stations from the CCC
- Sensor stations can also be operated locally

Graphic user interface
- Organized GUI allowing access to different functionalities through graphic buttons and Pop-up menus
- Integration with GIS, displaying all the information over the cartography
- Simultaneous display of visible and IR video

Integration with GIS
- Radar tracks and interception units are represented over the cartography of the area
- Measuring and analyzing tools are available for the operators
- Blanking and alert areas can be defined and customized

Digital video distribution
- Use of MPEG-4 video coding
- Distribution via IP multicast streaming
- Digital video processing with a wide variety of processing algorithms

Integration with tactical communication networks
- Use of the IP protocol
- Secured communications via encryption algorithms
- Adjustable transmission bandwidth depending on system requirements
- Flexible network communications architecture: microwave links, satcom links, leased lines...

High system availability
- 24h / 365d operation
- Minimum system life of 15 years
- System MTBF > 5000 hours
- Minimum availability of 95%

Security system integration
- Security system available at each SS
- Management and control of security centralized at the CCC
- Possibility to customize the type and number of sensors to be installed at each SS

General architecture of the SIVE system
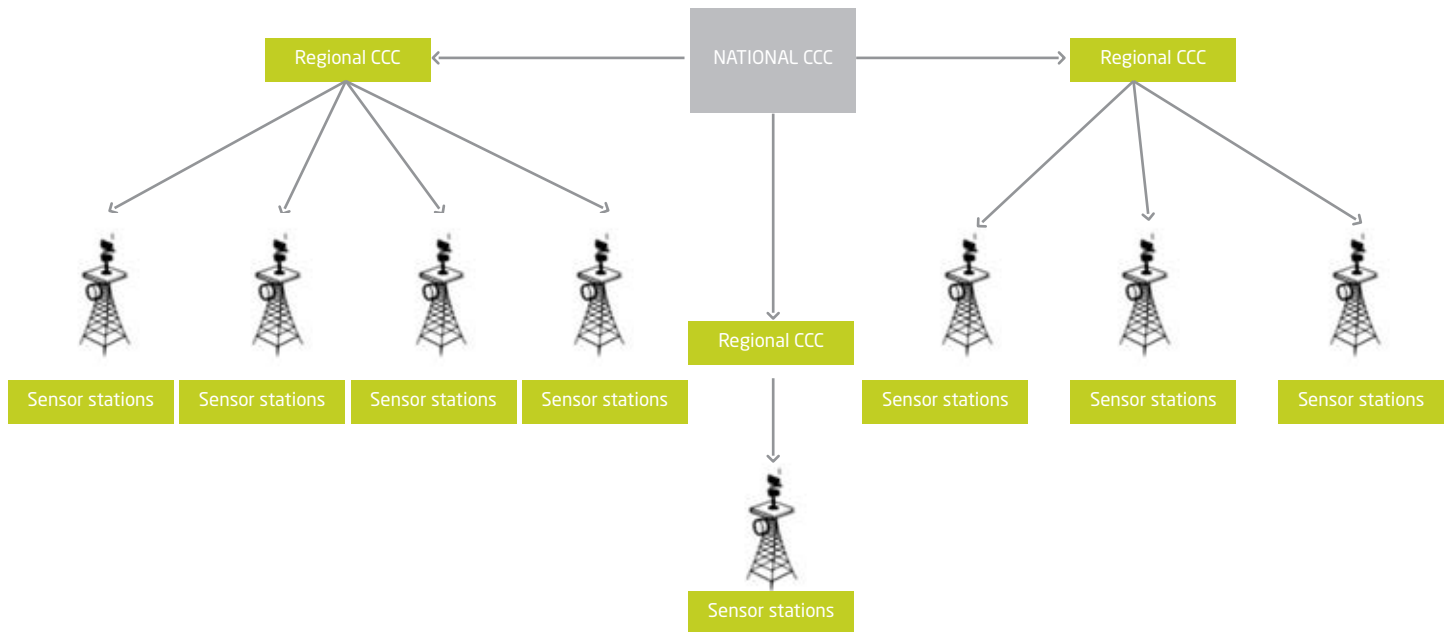
Sensor station

The sensor station is the surveillance data capturing element in the SIVE system. It integrates the data from the different sensors and transmits it to the CCC.

The 2 core elements in the SS are:

• Radar sensor
• Optronic sensor

Radar sensor

• X Band radar
• High resolution
• Low probability of Intercept
• FMCW
• Automatic tracking
• High gain antenna

Optronic sensor

• CCD and IR cameras
• High pointing accuracy
• Gyro-stabilized
• Video tracker
• Different pointing modes:
  - Manual
  - To radar track
  - To multiple radar tracks

Typical radar detection performance	
Small boat	39 Km
Semi-rigid boat	57 Km
Fast-Speed boat	63 Km
Small ship	66 Km

Typical CCD performance		
	Detection	Recognition
Small boat	20 Km	12 Km
Semi-rigid boat	22 km	15 km

Typical IR performance		
	Detection	Recognition
Small boat	13 Km	6 Km
Semi-rigid boat	14 km	7 km

SS architecture

Antenna

SMR radar station

Pedestal controller

Pressurizer dehydrator

Dual channel SMR rack

GPS antennas

Local control and monitoring system

Local display

Transmission link

Control center/tower

Remote control and monitoring system

A-SMGCS system
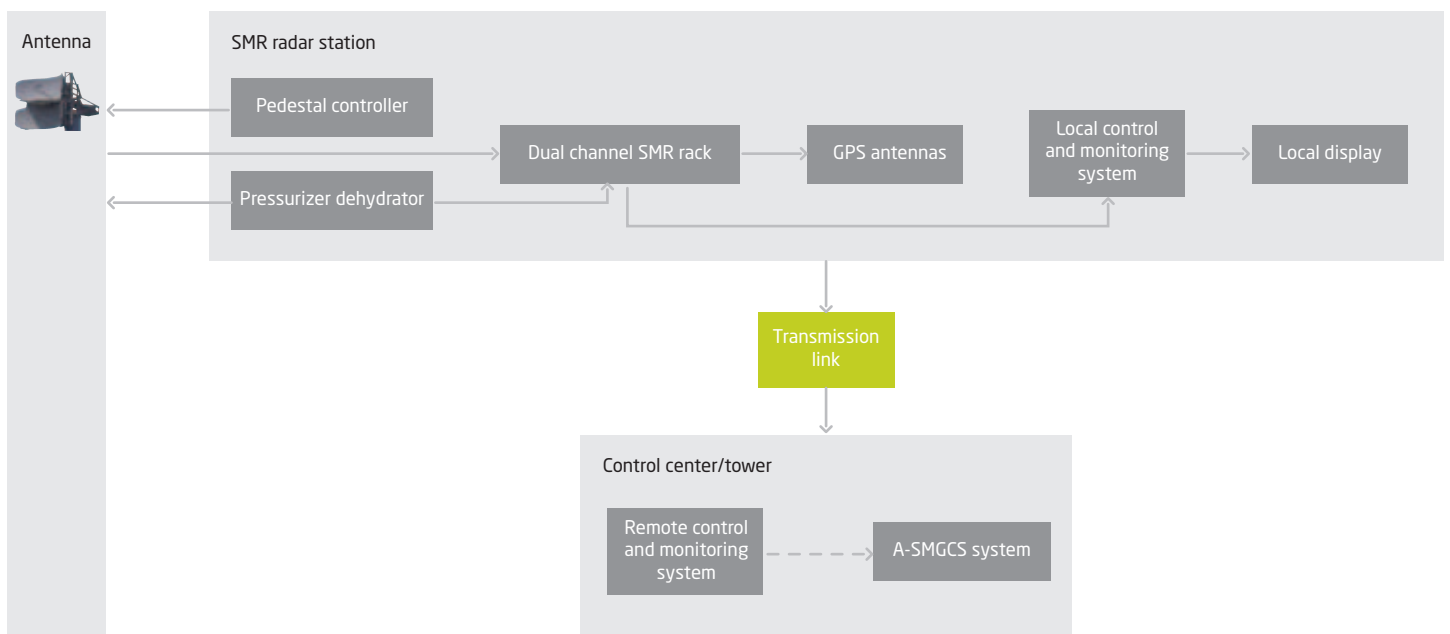
Command and Control Center

Operator's console

Command and Control Center

The CCC centralizes all the information received from the different SS's. It processes, integrates and displays all the information in real time.

Among other features, the CCC does:

- Remote control and management of all SS's sensors
- Real-time reception and processing of radar tracks
- Fusion of radar tracks from different stations

- Display of radar tracks and patrol units on the system cartography
- Real-time display of IR and CCD images
- Tactical situation display on Videowall
- Security/alarm management of stations
- Interfaces with other communications networks (PSTN, ISDN, GSM...)