

## Electromagnetical optimisation

### Shipboard electromagnetical environment

The shipboard electromagnetical environment is created by all installed communications-, electronics-, electrical- and electromechanical equipment. It is conducted by metallic structures and cabling. It is radiated intentionally by the antennas and unintentionally by loose connections, broken devices and non-linear metallic junctions "rusty bolts".

It is further on amplified and extended by adjacent antennas picking up the radiated signal and its harmonics, poor groundings and other ships and their equipment.

IEC 60945, EMC, R&TTE are the first steps in gaining the conformity but it is not always enough for the sensitive RF communications

*"The captain of HMS Sheffield, the British destroyer sunk by an Exocet missile during the Battle of the Falklands, had his ship's radar turned off so that he could use radio communications back to England.*

*It was because the radar was interfering with his operational phone communications that the captain ordered it shut down, and it was during the time the radar was off that the Exocet came in undetected. "Navy Times 14 July 1986*

*To help shipdesigners, -owners and -operators preventing EMI and gaining EMC*



### Our promise and professional services

#### Electromagnetical optimisation services

- electromagnetical modelling of the mechanical structures
- antenna pattern simulation with topside structures
- antenna location optimisation
- adjacent antenna intermodulation and separation analysis
- multi-band antenna feasibility studies
- communication system "simplification"

#### Measurement and troubleshooting services

- antenna radiation pattern measurements
- transmission line and antenna health measurements
- transmission and reflection power measurements
- conducted and radiated EMI measurements on board

#### Custom product services

- vessel specific antennas and antenna couplers
- based on our wide standard product range

#### For newbuildings and shipdesign

It is important to ensure the electromagnetical compatibility of shipboard topside structures well before it is built and welded - in the design phase.

» *simulation, desing and optimisation services*

» *custom product design for newbuildings*

#### For existing fleets and ship operators

When problems arise the consequences might not be unavoiaded anymore.

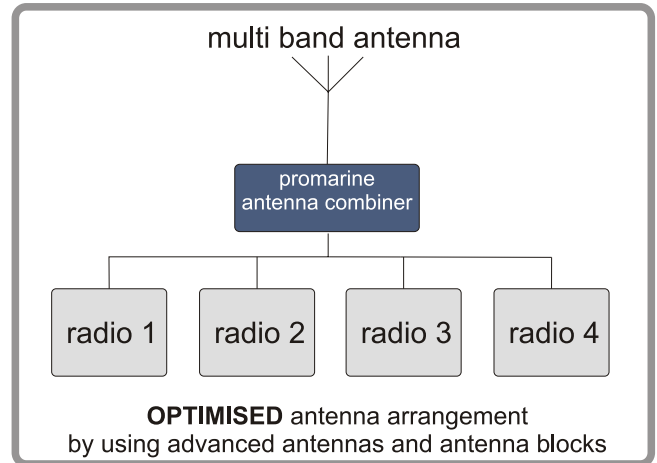
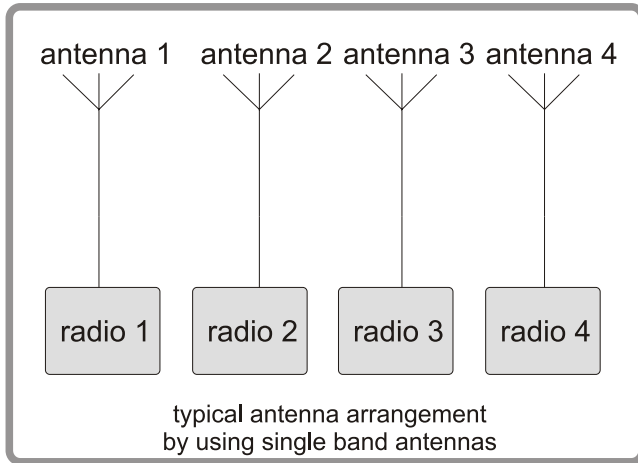
» *measurement- and troubleshooting services*

#### For system integrators

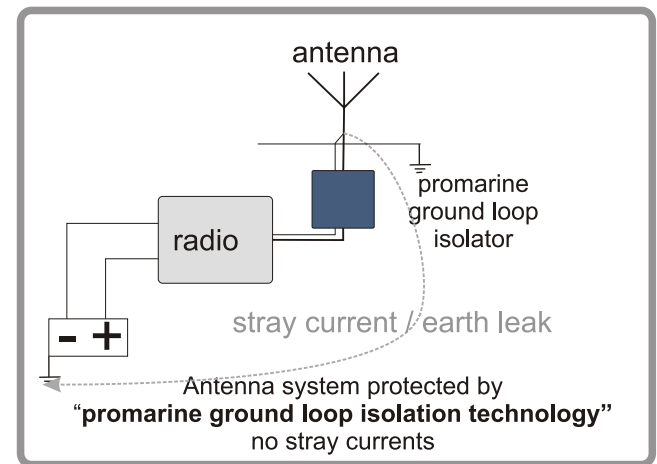
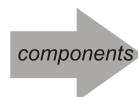
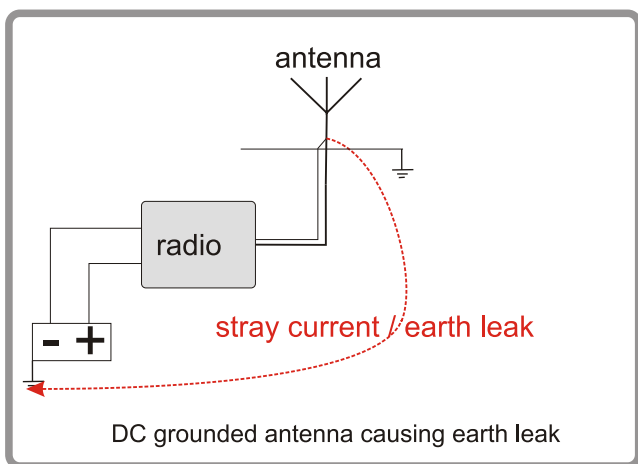
» *components to prevent and protect from EMI*

## Electromagnetical optimisation

### Antenna optimisation by using advanced components



### Preventing galvanic corrosion by using advanced components



### Performance optimisation

