



EXPAND YOUR BUSINESS WITH CANDI'S SOLUTION & PROFESSIONAL SERVICES

TURN KEY SOLUTION PROVIDER



Challenge The Invisible
The Leader

Nikos Papadimitriou
Technical Account Manager

Nikos Simatos
Account Manager Deepsea Sales Dpt



Microsoft
Partner



Gold Data Platform
Gold Data Analytics
Gold Windows and Devices
Gold Application Development
Silver DevOps
Silver Datacenter
Silver Application Integration
Silver Small and Midmarket Cloud Solutions



Our Partnership

Our Services

- **Custom Development**
- **Mobile Applications**
- **Modern Workplace (O365)**
- **AI**
- **IoT**
- **Azure**
- **Consulting / Training**

21st Conference-Infocom World 2019

DIGITAL SHIPPING SUMMIT “Digitalization in the Maritime Industry”

**Nikos Simatos
Account Manager DEEPSEA,
Furuno Hellas**

Digitalization of Navigation by Furuno

Divani Caravel, Athens Tuesday, 26th November, 2019

Organized by Infocom Media

FURUNO formed itself to a corporation in 1951. Since then, FURUNO has been introducing innovative equipment, having ultra-sonic and electronics technology at its core.



1948

The word “Fish Finder” started from FURUNO and expanded to the world.

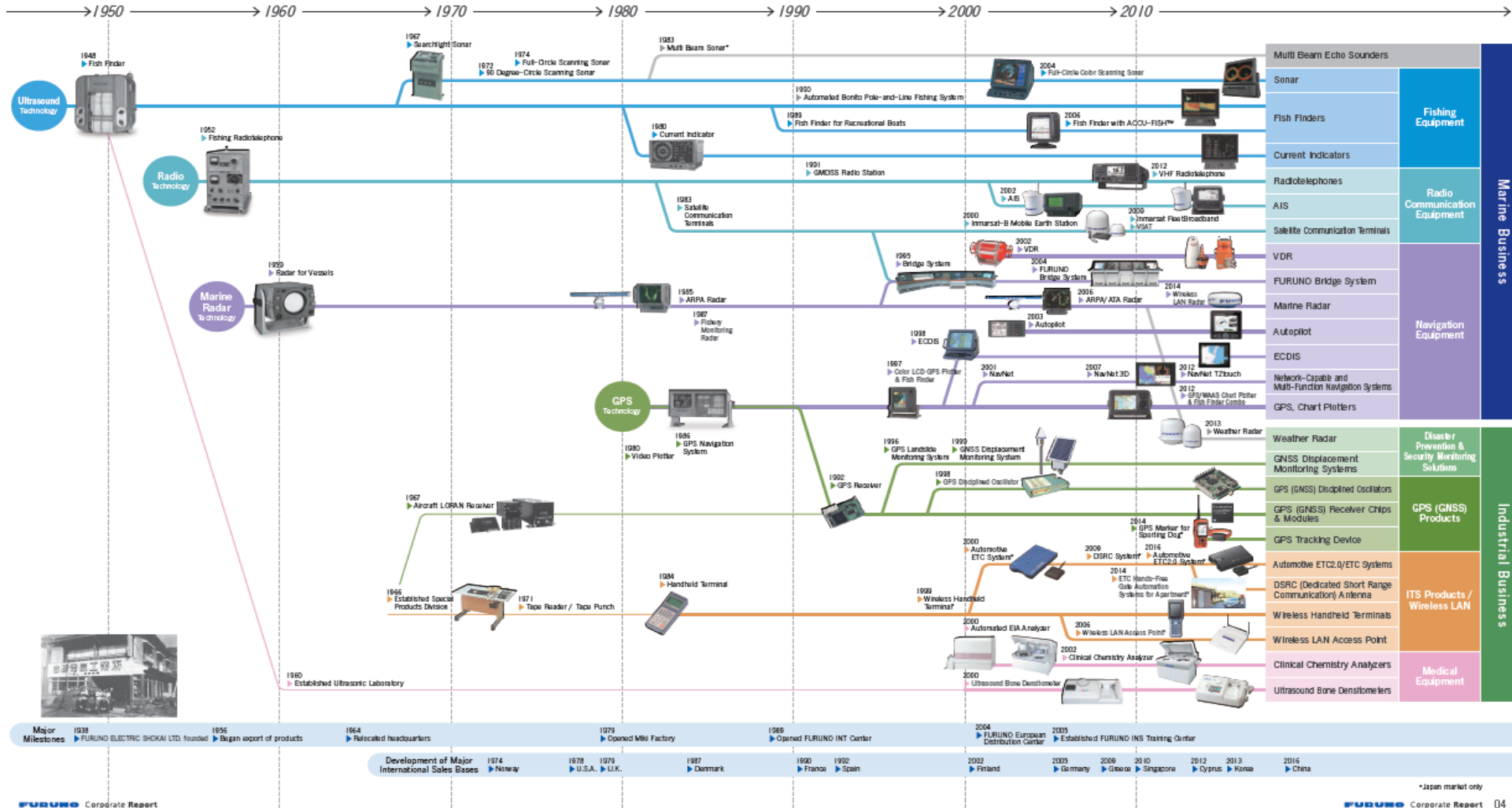
Introduction of Furuno

FURUNO

FURUNO's History

FURUNO will contribute to the development of society and industry previously invisible, using our SPC core competencies and our

by giving visual form to that accumulated know-how.



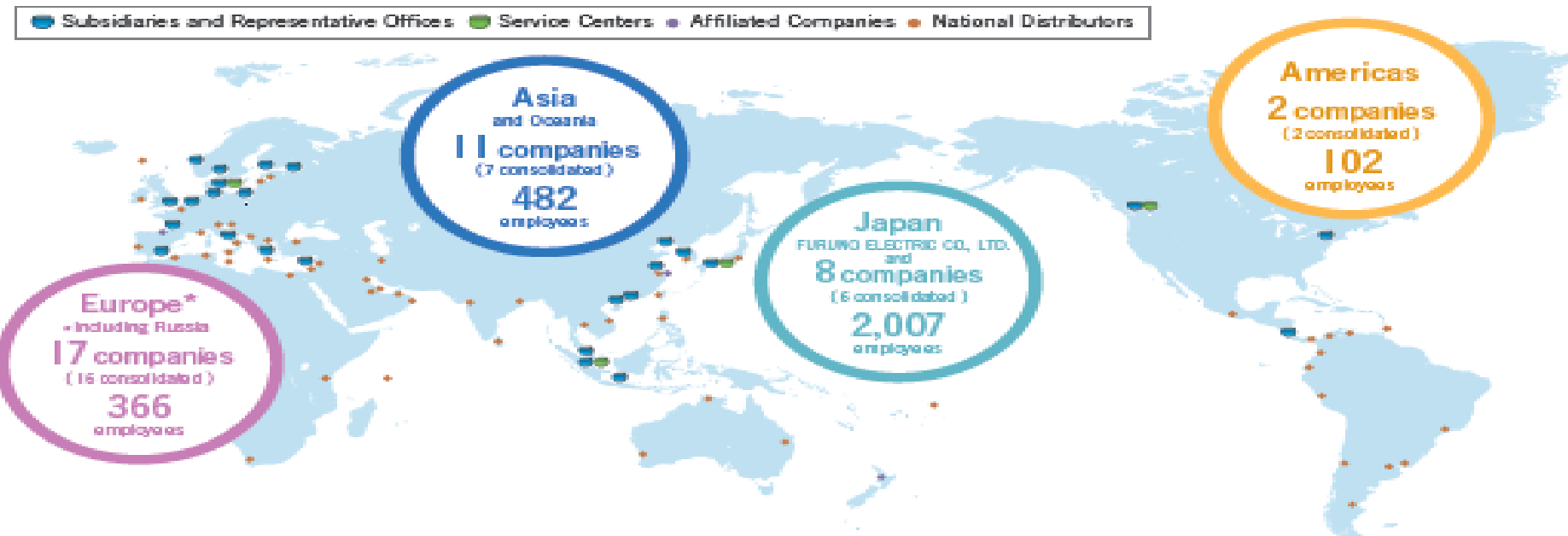
Furuno Honored with five NMEA awards wins, bringing their total to an unprecedented 230 awards!

2019-10-02

On September 19th, Furuno enjoyed an exciting evening of recognition at the 2019 NMEA Products of Excellence Awards ceremony, bringing home 5 plaques for their revolutionary products, including the coveted awards for Radar and Fish Finder. This brings Furuno's total to a staggering 230 NMEA Awards, more than any other two manufacturers combined!



Global Network / Corporate Information (as of March 1, 2019)



Europe

FURUNO (UK) LTD.
FURUNO NORGE A/S
FURUNO DANMARK A/S
FURUNO SVERIGE AB
FURUNO FINLAND OY
FURUNO POLSKA Sp. z o.o.
FURUNO DEUTSCHLAND GmbH
FURUNO EUROPE B.V.
FURUNO FRANCE S.A.S.
FURUNO ESPAÑA S.A.
FURUNO ITALIA S.R.L.
FURUNO HELLAS S.A.
FURUNO (CYPRUS) LTD
FURUNO EURUS LLC

Japan

FURUNO KYUSHU HANBAI CO., LTD.
FURUNO KANSAI HANBAI CO., LTD.
KYORITSU RADIO SERVICE CO., LTD.
FURUNO SYSTEMS CO., LTD.
FURUNO LIFEBEST CO., LTD.
FURUNO SOFTECH CO., LTD.
LABOTECH INTERNATIONAL CO., LTD.

Asia

FURUNO SHANGHAI CO., LTD.
FURUNO SOFTECH (DALIAN) CO., LTD.
FUNOTEC (DALIAN) CO., LTD.
FURUNO CHINA CO., LTD.
FURUNO HONG KONG CO., LTD.
PT FURUNO ELECTRIC INDONESIA
FURUNO KOREA CO., LTD.
FURUNO SINGAPORE PTE LTD
FURUNO ELECTRIC (MALAYSIA) SDN. BHD.

Americas

FURUNO U.S.A., INC.
FURUNO PANAMA, S.A.



- ✓ Reduce costs
- ✓ Increase operational efficiencies
- ✓ Enhance safety
- ✓ Become more sustainable
- ✓ Reduce environmental impacts

Lloyd's Register

Market Stakeholders:

- ◆ Original Equipment Manufacturers for Autonomous Ships (OEMs)
- ◆ Suppliers & Solution Providers of Ship Automation Systems, Steering Gear Systems (S/W, H/W, Service)
- ◆ Ship Operators
- ◆ Regulatory Authorities (local + international)
- ◆ Law Enforcement/Security bodies

Few Examples of Autonomous/Smart Ships:

MASS (Maritime Autonomous Surface Ships)

ASV (Autonomous Surface Vehicles)

USV (Unmanned Surface Vessels)/**UMV** (Maritime)

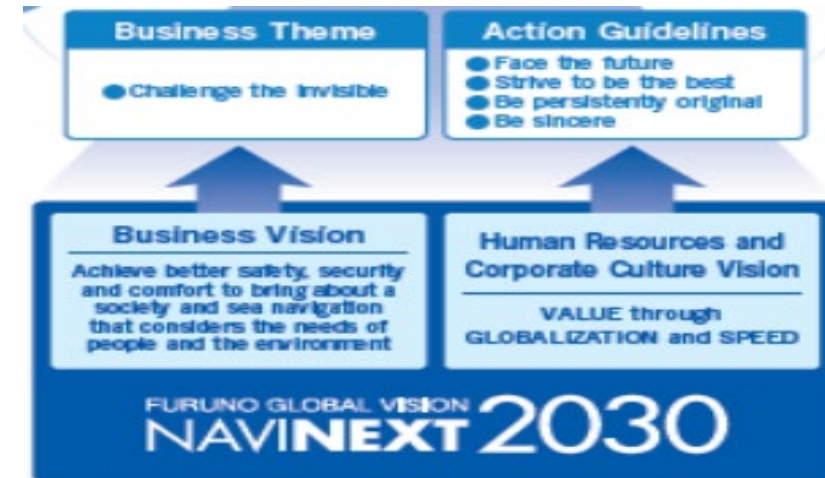
ROV (Remotely Operated Vehicles)

Drones–Smartships

AUTONOMOUS TECHNOLOGY IS AVAILABLE....
BUT COLREGS/SOLAS REGULATIONS NEED REVISION



On occasion of company's 70th Anniversary, Furuno announced :



*Ideal business structure to make innovative changes & create advanced technologies, creating **VALUE** to the shipping community.*



Create Synergies with innovator companies, institutions & classification societies (i.e MOL, NYK, MLIT, NKK)



Design Added Value Services & Products that can be adopted easily in Early stage of autonomous era i.e:

- Aid for Improved Situational Awareness System
- Remote Monitoring/ Maintenance




Design Next Stage special software for autonomous era:
=> Judgement/Automatic Collision Avoidance, AI etc



Enable OEM Developers of autonomous technology, integrate our sophisticated sensors into their applications

3rd parties autonomous special s/w are using **SDK** of Furuno sensors on autonomous vessels as
part of
Data Fusion

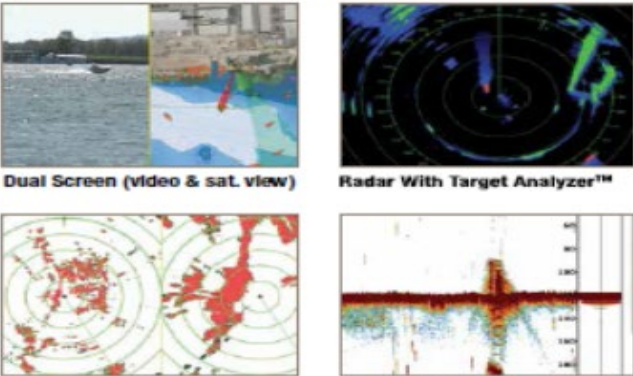
BUILDING LASTING PARTNERSHIPS THROUGH TECHNOLOGY, RELIABILITY & SUPPORT



Port & Harbor Security Weather Monitoring Coastal Monitoring Airport Security Unmanned Vessels

**DELIVERING THE RESULTS YOU NEED,
THE RELIABILITY YOU WANT, AND
THE DEPENDABILITY YOU CAN COUNT ON!**

Furuno's Software Development Kit (SDK) gives OEM developers 100% control, with the ability to integrate Furuno's award-winning Radar and Acoustic sensors into your own custom applications. Choose from a wide variety of Radar and Acoustic sensors. Furuno sensors are perfect for a wide array of applications, including coastal monitoring, land/sea security, government land/sea applications, unmanned vessels, fish farm monitoring, oil rig docking, bird migration and more. You dream up the application and we'll supply the sensors.



Dual Screen (video & sat. view) Radar With Target Analyzer™
Dual Range Radar Depth With Real Time A-Scope

Station 1 **Station 2** **Station 3**

SAMPLE SURVEILLANCE PLATFORM

SAMPLE UNMANNED VESSEL

INTERNET

— Ethernet
— CAN bus
— Other

Rig Security Terrestrial Security Government Applications Fish Farm Monitoring Bird Migration & Monitoring

2017/ Tug “Svitzer Hermod”, Damen Built.
1st Remotely Controlled Vessel



2017–2018/ Trimaran–Drone “Sea Hunter”
DARPA US/Navy .
1st Autonomous–Unmanned Vessel (MDUSV)



2019/ Patrol Boat & Oil Spill Response by
Sea Machines



2019/ RoRo NYK Iris Leader
Fully–Autonomous ship trial



Iris Leader. Credit: Dietmar Hasenpusch

=> First two projects already from PoC to materialization on dozens of ships:

Remote Monitoring & Support System

- Name: **HermAce**



- Developed by: Furuno Hellas SA
- 1st Customer: Thenamaris

Digitalization of Navigation - Augmented Reality Navigation System

- Name: **AR-100M**



- Developed by: Furuno Electric HQ
- 1st Customer: MOL



FURUNO ENVISION

The latest technological solution designed to usher in a new generation of tremendously enhanced navigation aids

NEW

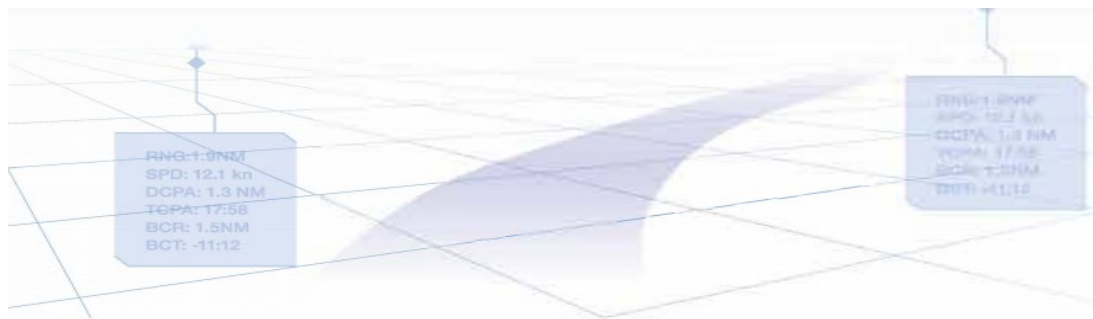
FURUNO ENVISION series

AR Navigation System

An advance navigation support tool
with fully leverages the power of augmented reality



“AR” stands for **Augmented Reality** by which digital information by Furuno’s core navigational technology, is superimposed on the live footage taken by camera in real life.



- Supporting Watch-keeping and Ship Operation during Voyages to Ensure World-leading Level of Safety -

Nishinomiya-shi, Hyogo Prefecture) and MOL Techno-Trade, Ltd. (President: Hirokazu Hatta; Headquarters: Chuo-ku, Tokyo) on 21 MOL Group-operated very large crude oil carriers (VLCCs).



AR Navigation, the first part of the FURUNO ENVISION series.

Co-developed with MOL, and thoroughly tested on their PCC and VLCC.

- ◆ **To reduce OOW's workload**

- ◆ OOW conducts overall situation oversight in his/her head, taking into account all the information obtained from navigational watch, radar images, TT/AIS, route planned on the ECDIS.

- ◆ This information amalgamation process is expected to continually performed to make a judgement, especially in the congested waters. This results in the potential risk of human errors, e.g., slip-up, misjudgement, etc.

- ◆ **To reduce the risk of human errors**

It is necessary to grasp the situation in the vicinity of the ship in an intuitive manner.

⇒ Graphical amalgamation of information obtained through navigational watch and sensor information is necessary

⇒ to be facilitated by **“AR navigation system”**



AR-100M System side

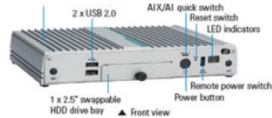
IP camera



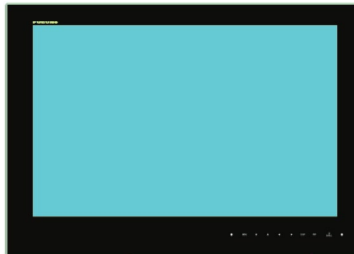
PoE Adapter



Processor PC

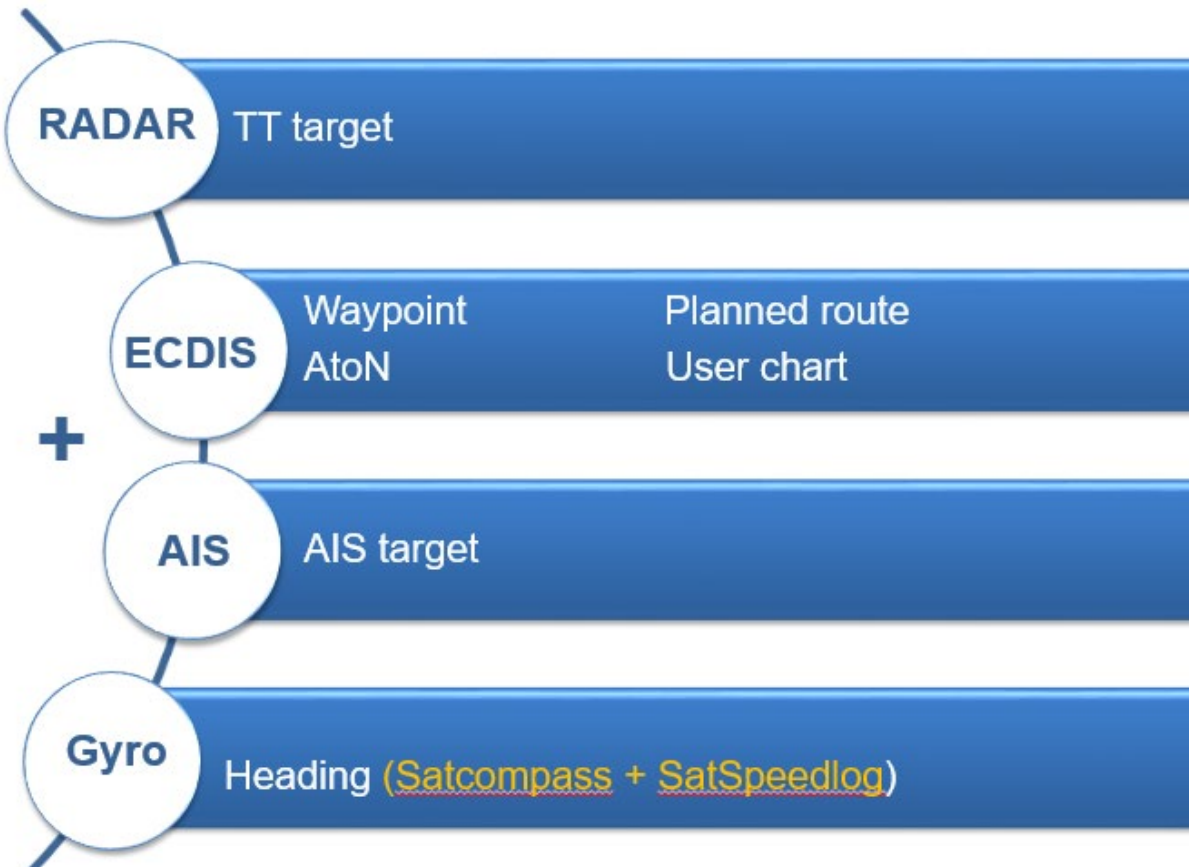


Trackball



MONITOR UNIT

Furuno Nav. Sensors side



Furuno's New Vision (AR Project)

Installation on board PCC

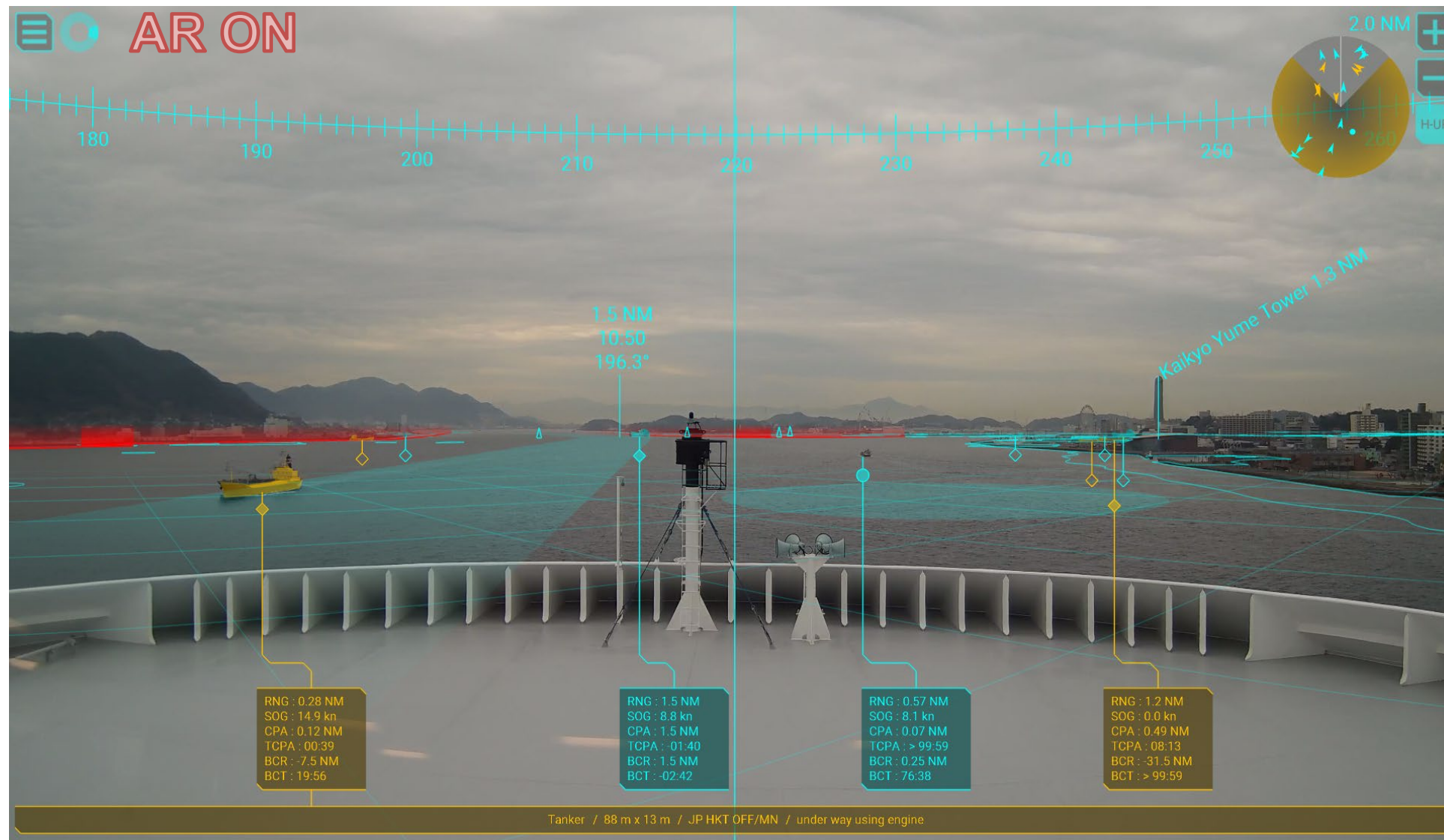
FURUNO





Furuno's New Vision (AR Project)

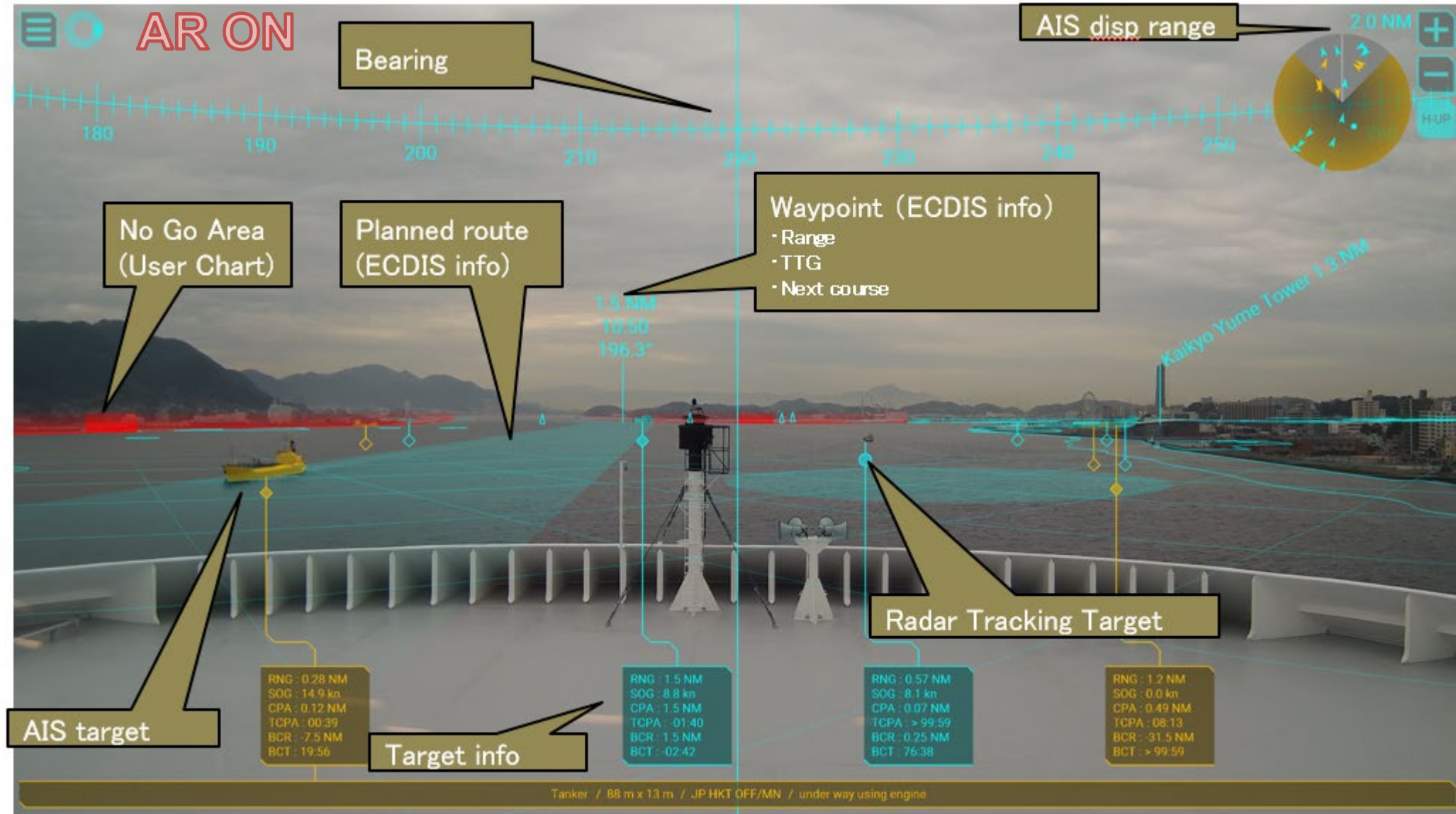
Fusion of Data



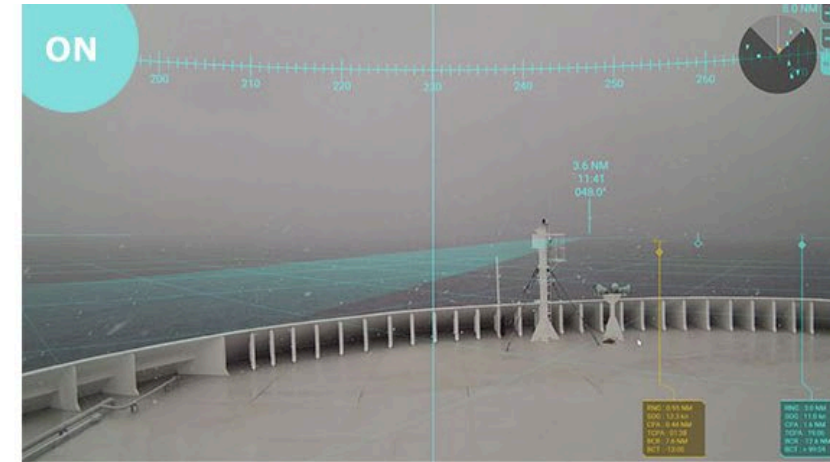
Furuno's New Vision (AR Project)

Fusion of data

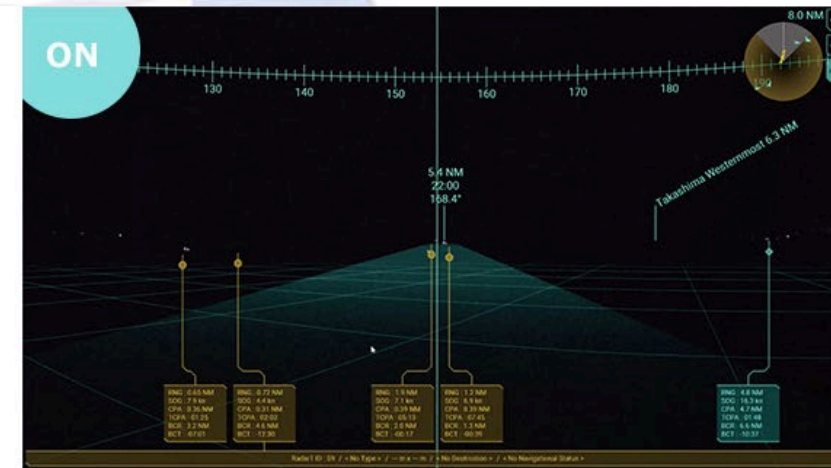
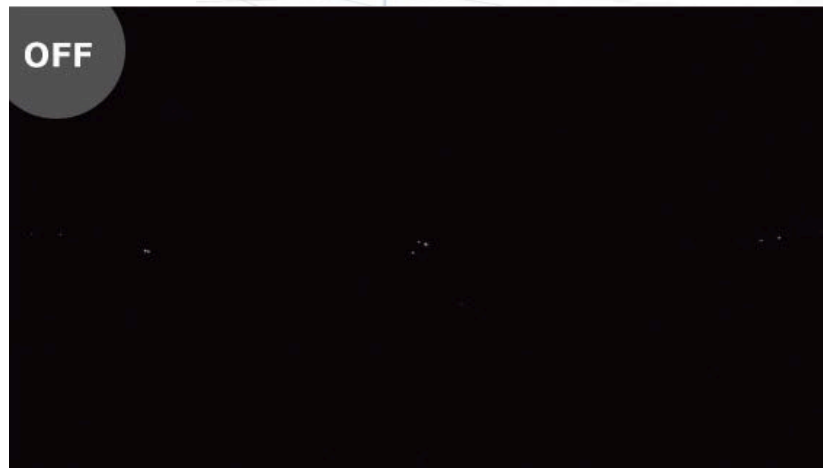
FURUNO



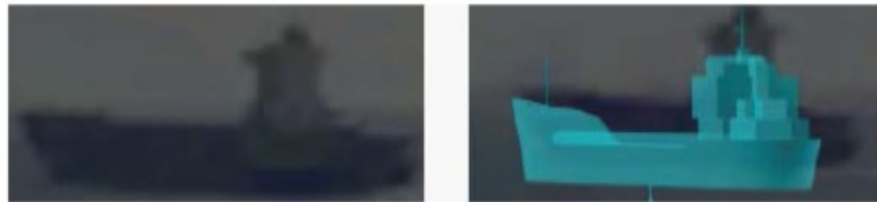
Poor visibility in case of rain, fog, snow etc.



Poor visibility in case of night time.

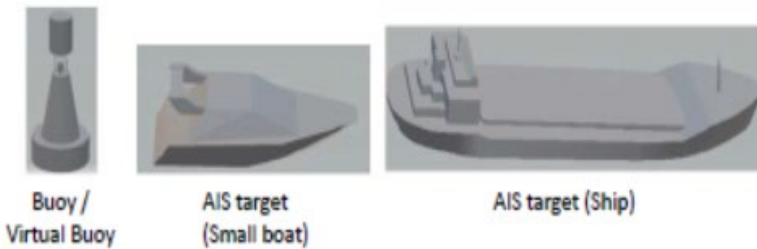


AIS target shape



AIS target shape: OFF

AIS target shape: ON

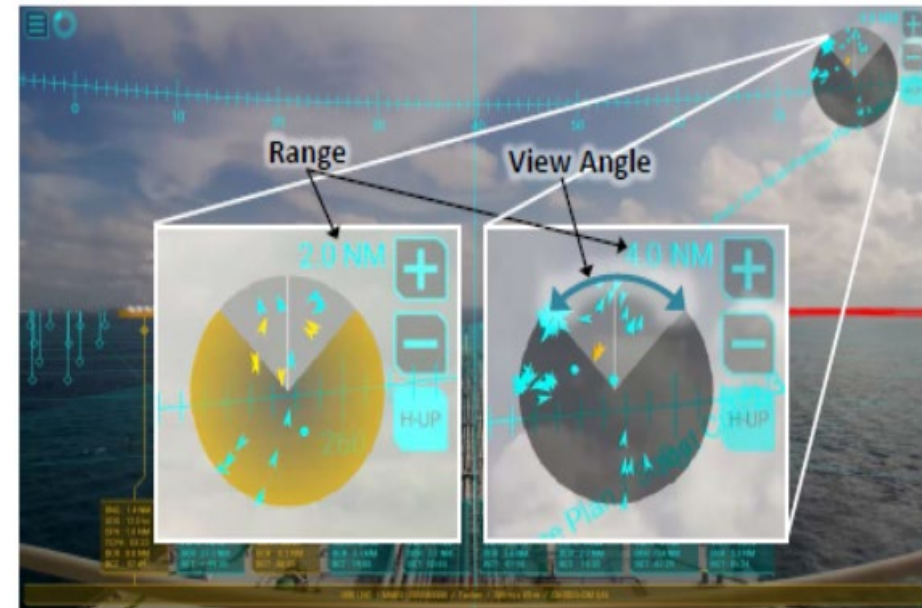


Buoy /
Virtual Buoy

AIS target
(Small boat)

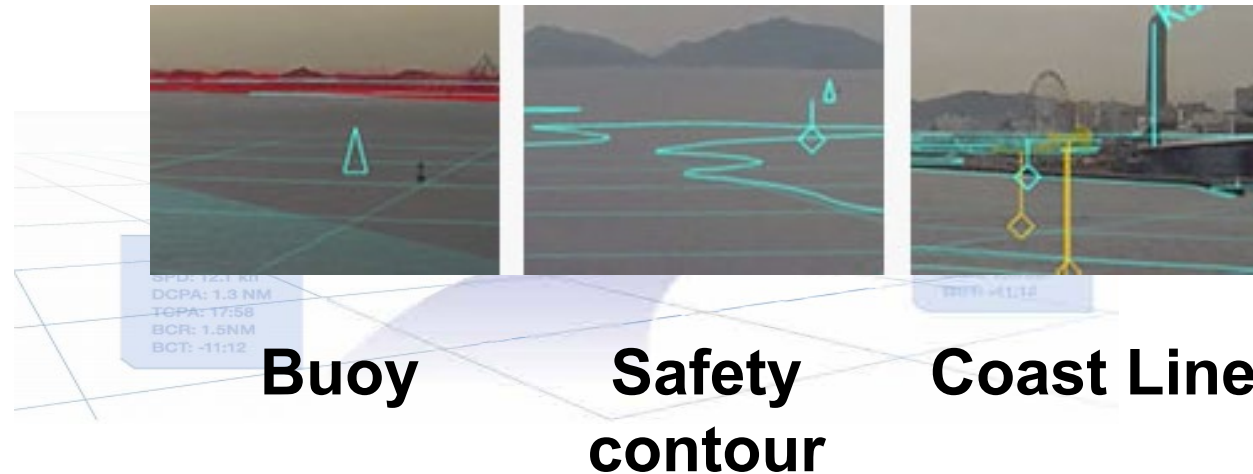
AIS target (Ship)

TVI (Top View Indicator)





**No-go area Land mark Customized Pilot station
area**



AR navigation system AR-100M

- ✓ Provides support in terms of navigational watch with the information gained from FURUNO equipment (Radar, ECDIS, AIS, etc...) to reduce OOW's workload.
- ✓ Delivers completely innovative values and resultant effects, regardless of sea/weather conditions, day/night time, and congested waters.
- ✓ Increase situational awareness on board currently and in future for remote control/monitoring
- ✓ A voluntary system for navigation aid (non-mandatory)



Future Navigation Solutions

Thank you for your attention!