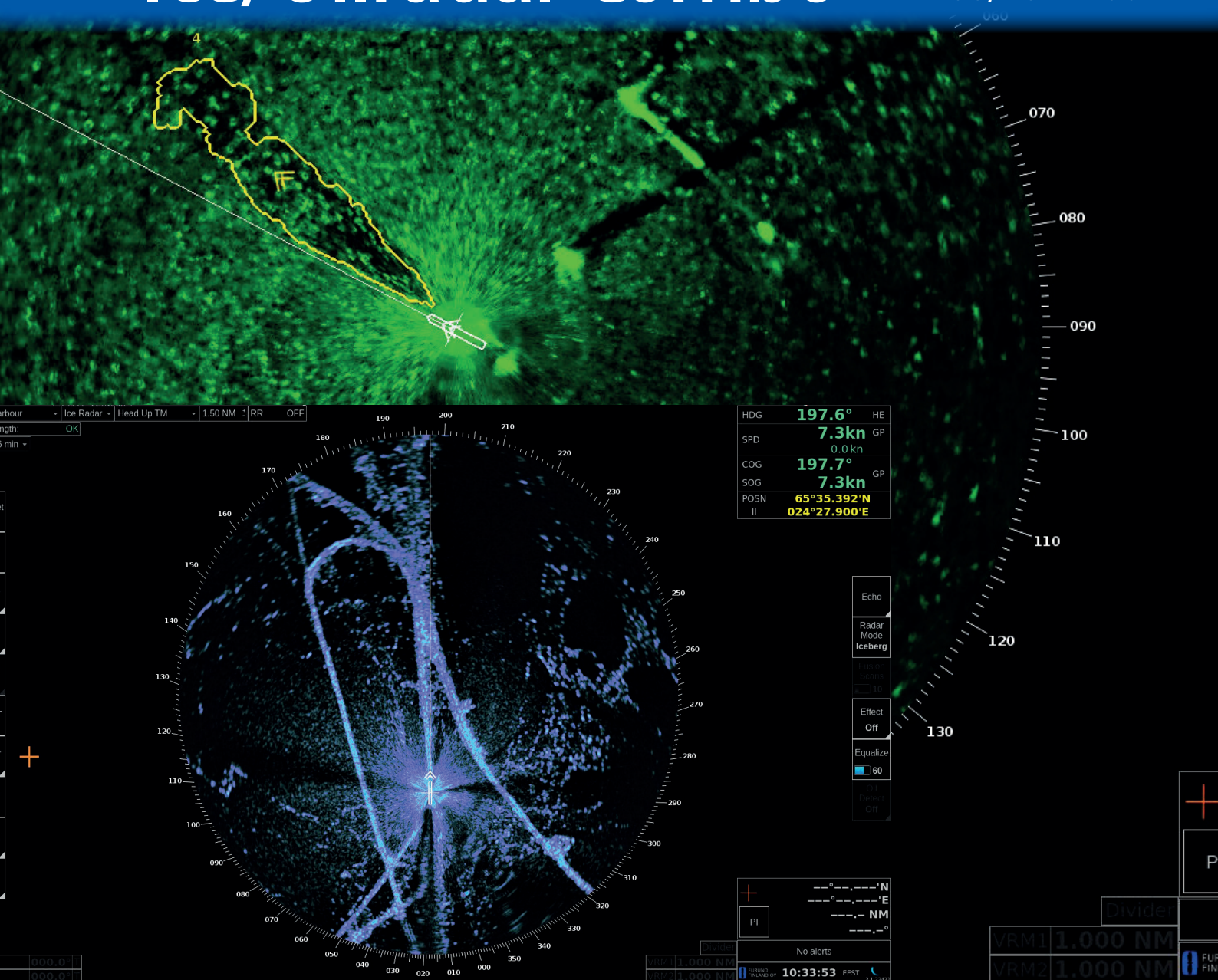


Iceradar FICE-100

Oilradar FOIL-200

Ice/Oilradar Combo FICE-100/FOIL-200



FURUNO FINLAND OY

Increase safety

Iceradar FICE-100 is refined radar technology specifically suited for ice navigation. The ice radar is useful for ships of all sizes operating in icy conditions.

The device is connected to the vessel's navigation radar and the device utilizes the navigation radar signals and calculates the radar algorithms for the water / ice interface.

- The ice radar visualizes ice structures
- Discovers the optimum route to go through ice
- Shows the track in bad visibility
- Usable ice detection up to 6 NM
- Ice radar stabilizes the ice picture compared to the navigation radar using advanced algorithms
- Ice radar is a supplementary system for navigation radar to observe ice conditions using the same outdoor equipment.

Hybrid ice radar

Hybrid ice radar captures the raw radar signal from the navigation radar. In this principle navigation radar remains IMO approved without affecting any navigation radar's operation. The high performance ice radar picture is created in a separated processor and shown in its own display. Products have been tested according to IEC60945(2002).

The FICE-100 removes the image noise making the fine structures of the ice more visible. The result is a stable image that includes the fine details found in the radar echoes.

VRM1	0.500 NM
VRM2	1.249 NM
Divider	

Find the best route through ice

By using ice radar vessels can find the old rifts, clean ice and channels made by icebreakers and other vessels. Finding and using these, the vessel consumes much less power and saves fuel and time.



FICE-100 is an alternative to an Infrared camera

Infrared cameras are challenging to maintain in icy conditions. Ice radar is more reliable and usable system than thermal cameras to observe ice conditions.

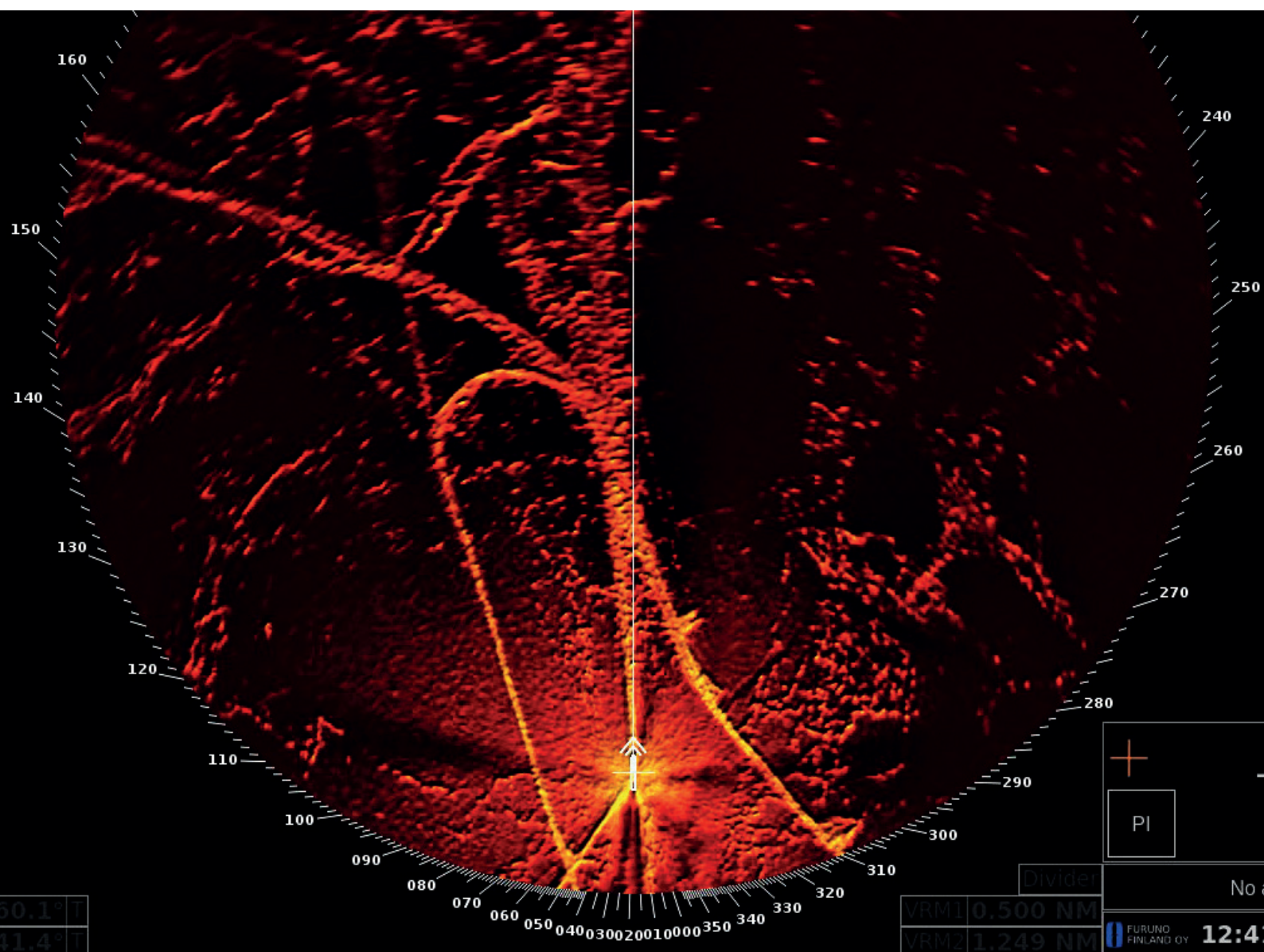
FICE-100 features for navigation in icy conditions

FICE-100 has many helpful features for mariners to see situational ice picture:

- 3D and Edge effects
- Equalizer
- Color palette

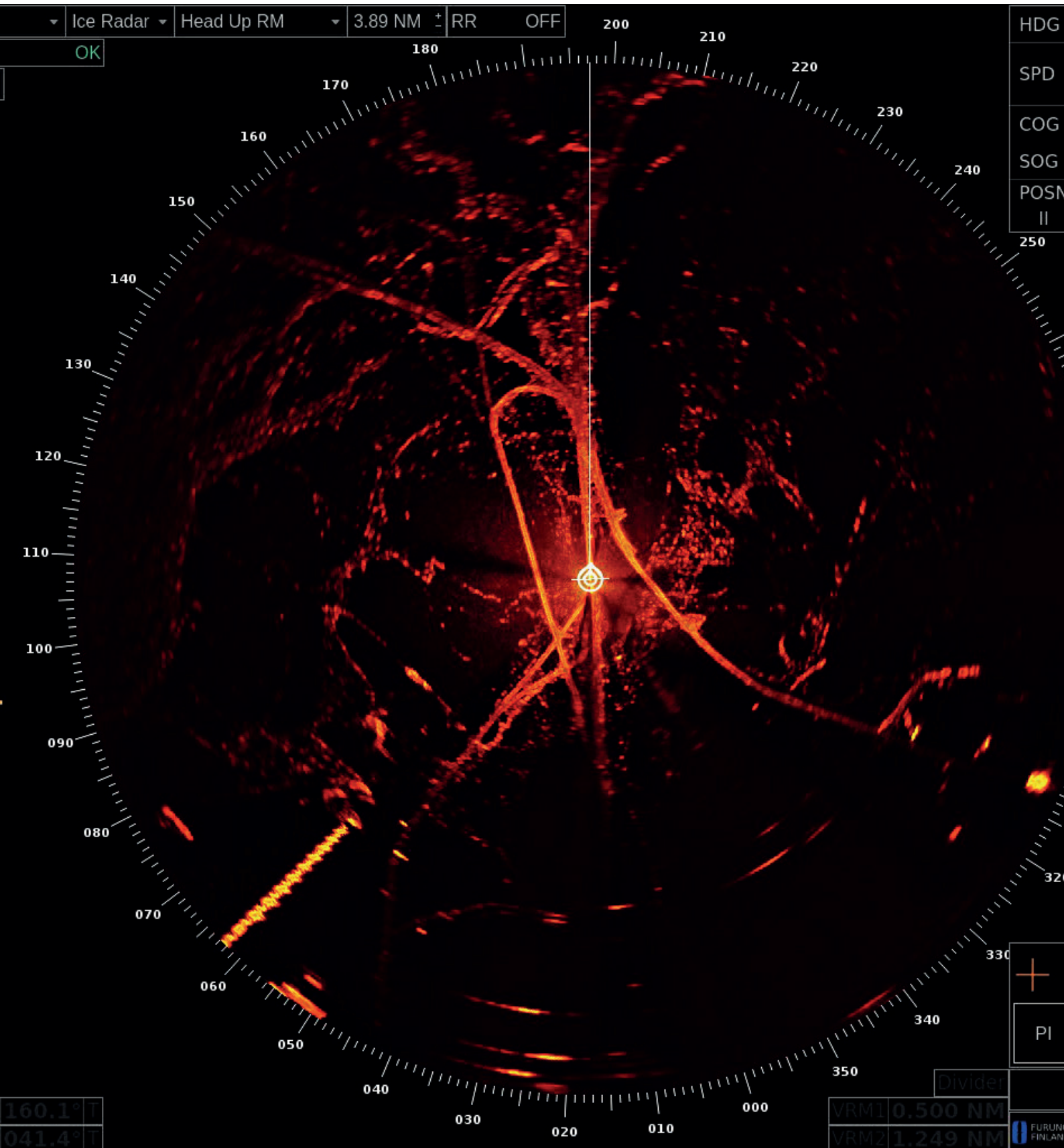
The conditions are different and changes all the time. These features are easy to select, adjust and operate in challenging environment to give more clear and visible picture to the user. The following screenshots are examples of real conditions.

3D effect emphasizes shapes and shadows:



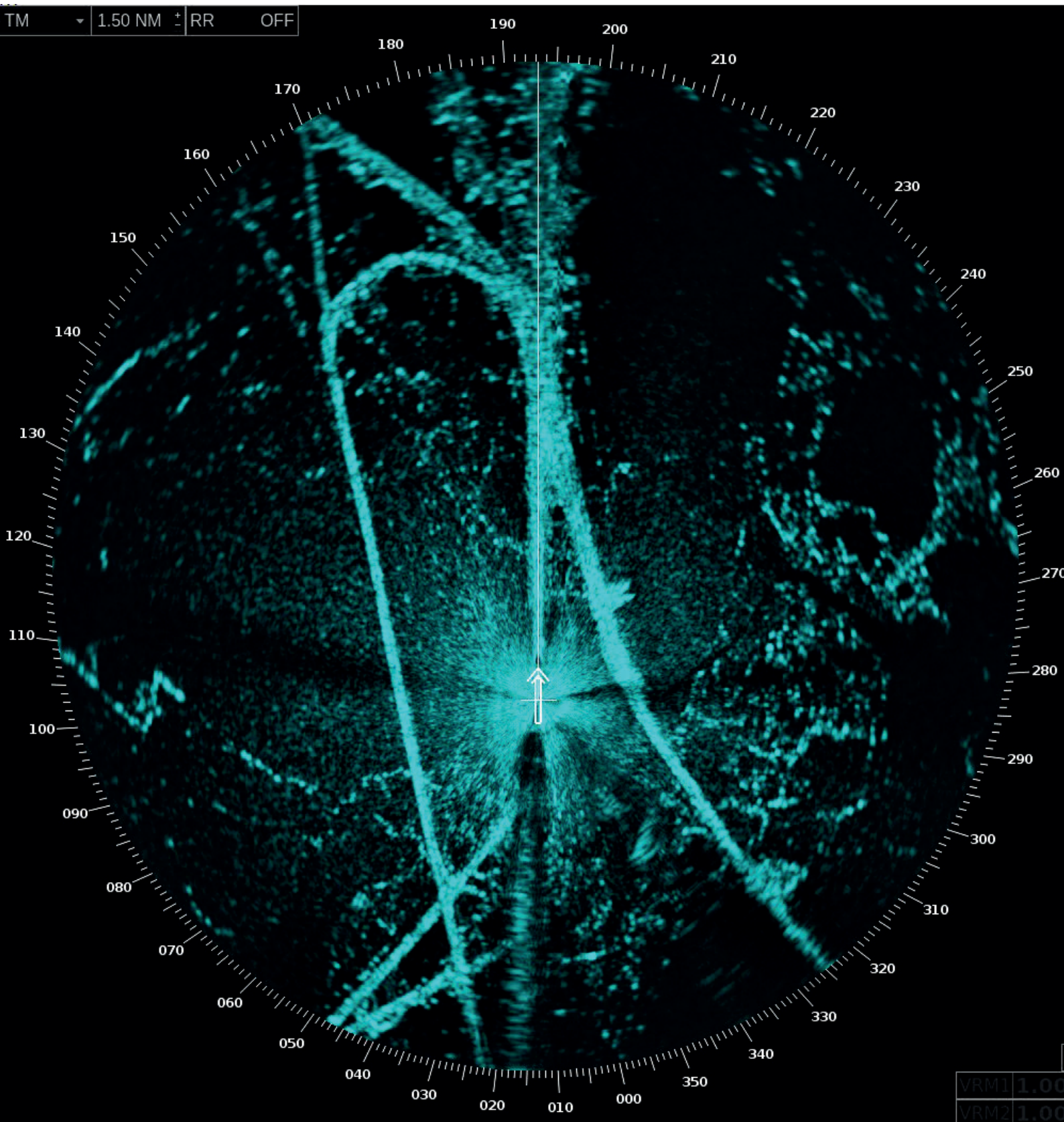
Iceradar FICE-100

Edge effect emphasizes edges of rifts:



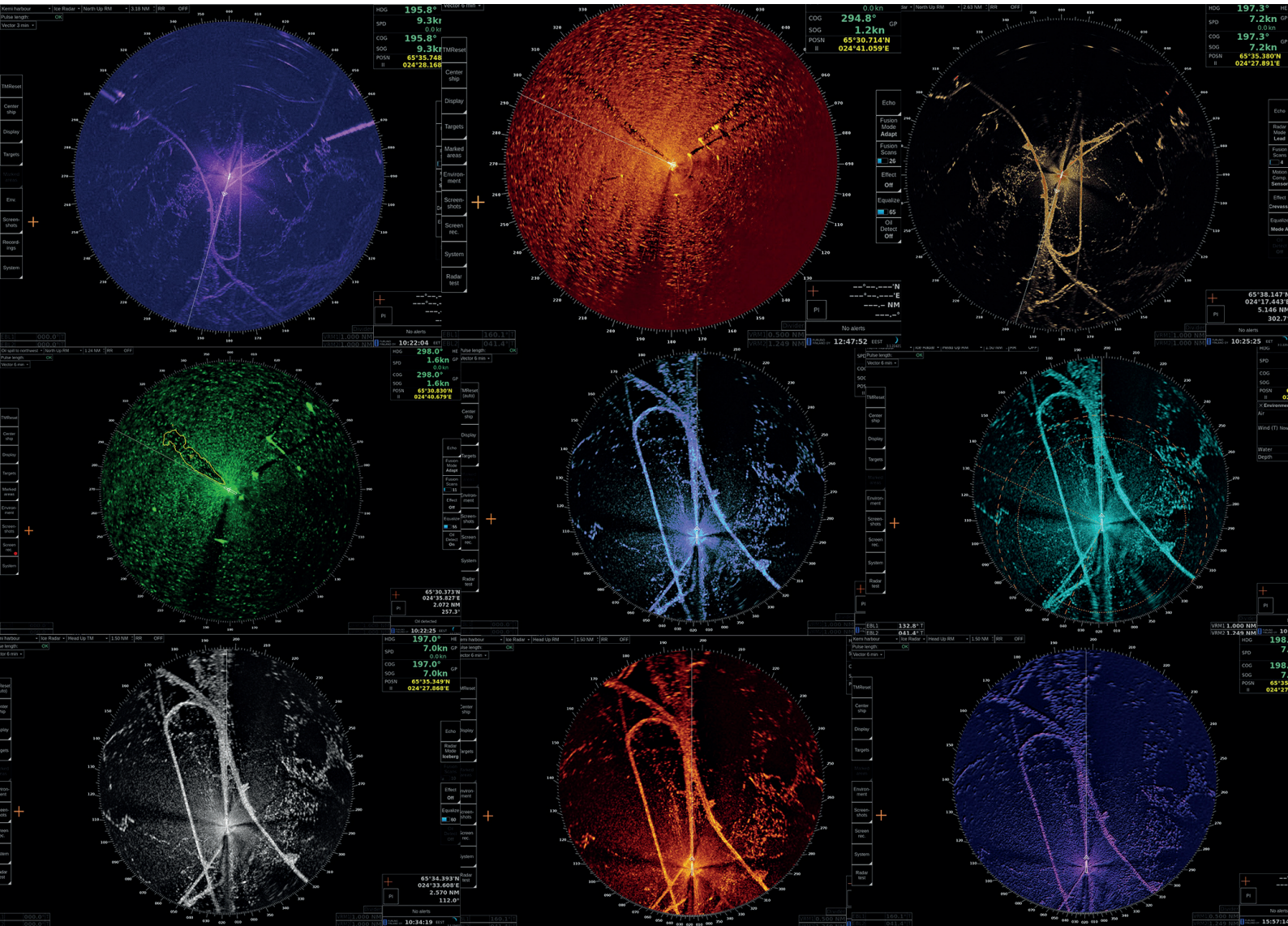
Iceradar FICE-100

Equalize feature visualizes ice radar picture with adjusted brightness ratio both on center and near edge of display:



Iceradar FICE-100

User can select predefined color palettes for ice layer. Each of them can be customized by user. Different color palettes are useful in changing environmental lightings:



Oilradar FOIL-200

24 NM | RR | OFF

Oil radar for offshore and onshore installations

Oil spill detection radar can be used in offshore and onshore installations together with standard navigation radar. Max range is 6 nm.

The installation can be done onboard the vessels, oil rigs or any other platform where the radar is needed to detect oil spills.

Mark the oil spills

The Oil Radar detects oil spills automatically and creates a polygon to mark the spill and calculates the coverage. User can manually input oil slick thickness when the system automatically calculates the total oil volume. User can also mark the oil spills manually with polygons and update them whenever it is required.

Process and analyze the raw radar video

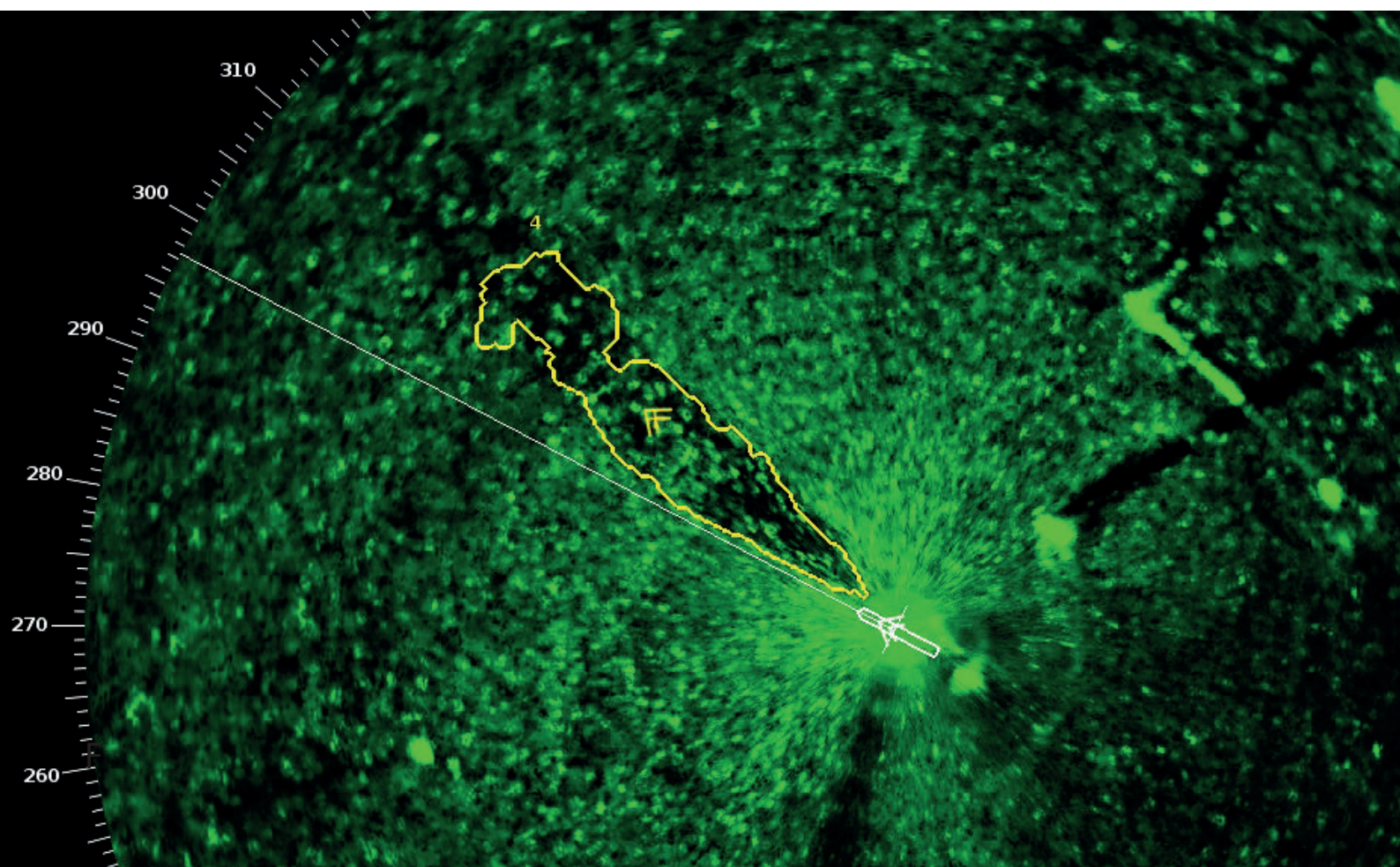
FOIL-200 oil spill detection radar is connected to standard Furuno IMO navigation radar. It uses the raw radar video from the navigation radar. The special high performance algorithm is used to process and analyze the raw video to detect oil spills.

To achieve the most efficient image to detect oil, user can change between different Fusion modes and see the result in real time on the screen. Oil spill image is created with an integration of up to 64 radar antenna scans. Generated image is based on motion compensated Fusion scans. User can adjust the Fusion Scan number together with Fusion Mode.

Oil radar features

Oil spill movement:

- direction and speed with visual arrow and numeric values
- automatic recording of screenshots
- user adjustable recording interval of screenshots



OIL-200 oil radar has statement from Norwegian Clean Seas Association for Operating Companies - NOFO. Statement is regarding oil spill remote sensing systems suitable for NOFO mode of operation.

Ice/Oilradar Combo FICE-100/FOIL-200

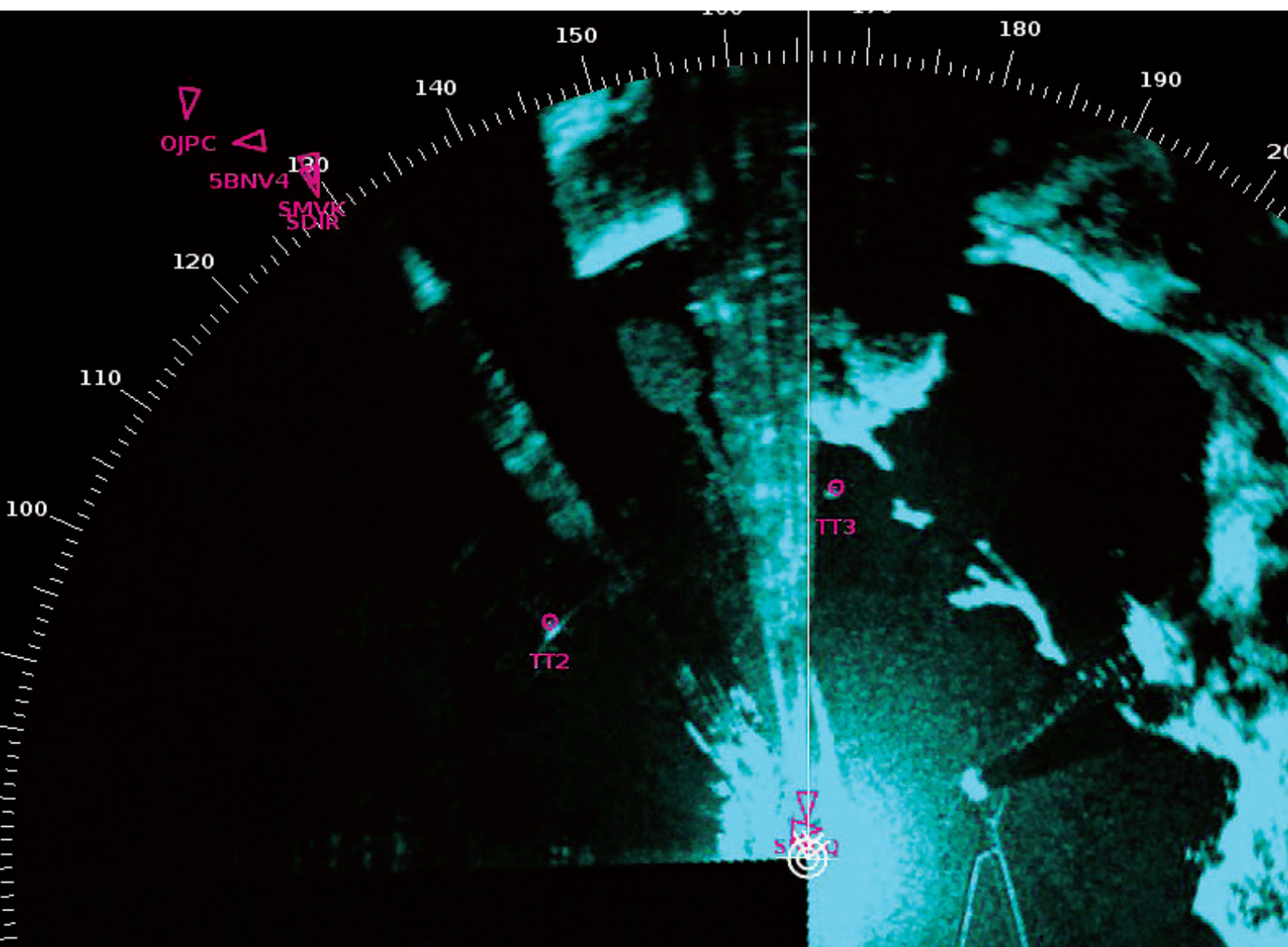
Combo is ice and oil radar in one hardware

Ice/oil radar combo is cost effective solution to get both softwares on board in one hardware. In combo user can select either ice or oil radar mode in operation at the time. In both modes all userfriendly functionalities are easily available.

Combo has the following common features which are also in individual softwares. FICE-100 ice radar and FOIL-200 oil radar can be used with Furuno FAR-15x8, FAR-2xx7, FAR-2xx8 and FAR-3000 IMO radars.

Target presentation: symbol and data

- AIS targets received from AIS transponder
- ARPA targets received from navigation radar



Ice/Oilradar Combo FICE-100/FOIL-200

Navigation tools

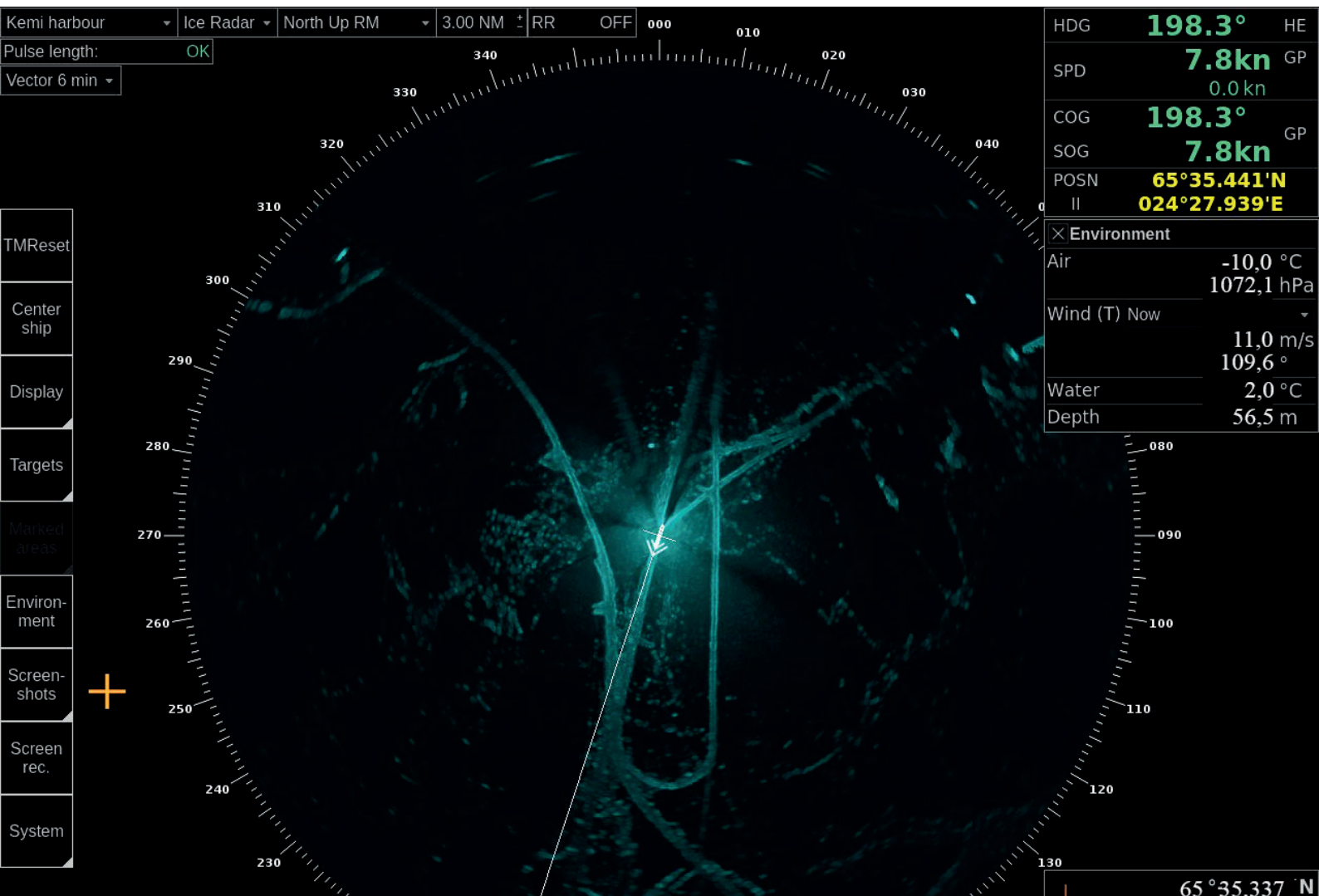
- Divider measures distance between two points
- Electronic bearing line (EBL)
- Variable range marker (VRM)
- Parallel index lines (PI)

Information from Weather Sensor

- Wind information
- Water temperature
- Air temperature
- Depth information

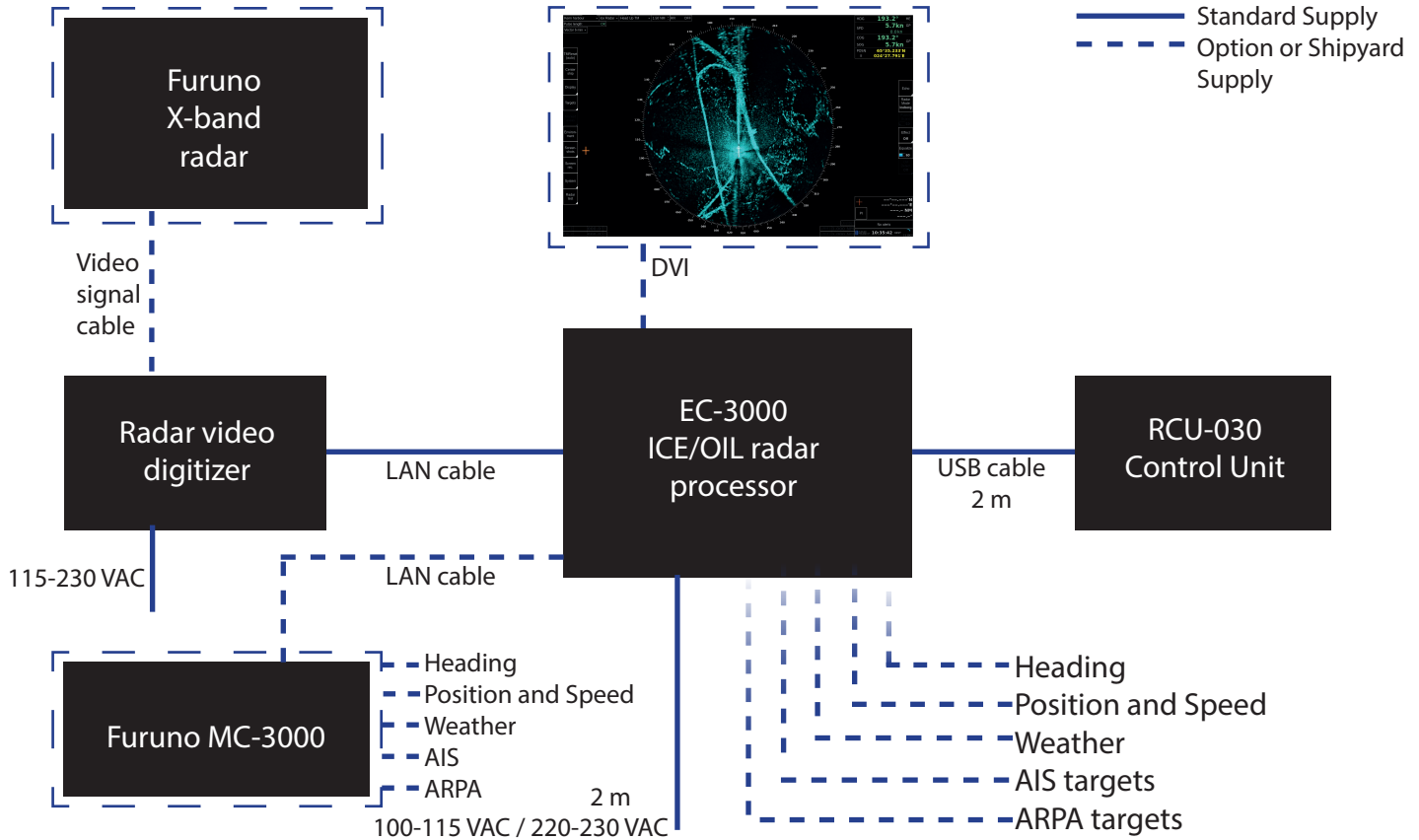
Screen recording function

- Predefined interval to take screenshots (.jpg files) which can be viewed on FICE-100 and FOIL-200. These can also be exported to USB memory storage.



Iceradar FICE-100 Oilradar FOIL-200 Combo

Interconnection diagram



SPECIFICATIONS		EQUIPMENT LIST	
General	Ice/Oil radar processor with display output DVI	Standard	1. Furuno EC-3000 Ice/Oil radar processor
	Processor power supply 115/230 VAC, 50/60 Hz (jumper)		2. Furuno RCU-030 with 2 m cable
	Trackball control unit		3. ScanStreamer DNP2016009-101 with 2.5 m power cable and 5 m LAN cable
	High resolution high bandwidth digitizer 14 bit, 60 MHz sample rate		4. Standard spare parts and installation materials
	Digitizer power supply 115-230 VAC, 50/60 Hz		
	Products have been tested according to IEC60945(2002).		
Input signals	Radar signals Furuno FAR-15x8, FAR-2xx7, FAR-2xx8 and FAR-3000 IMO radars	Option	1. Radar display with DVI cable (Specify display type when ordering)
	- radar video and trigger		2. 5/10/15/20/30/40/50 m Signal cable
	- azimuth and heading line signals		
	Heading, position, speed, weather, AIS targets and ARPA targets (IEC61162-1/2 or IEC61162-450)		

*) Minimum requirements for radar signals: Transceiver 12 kW, antenna radiator 4 ft, gear box 24 rpm.