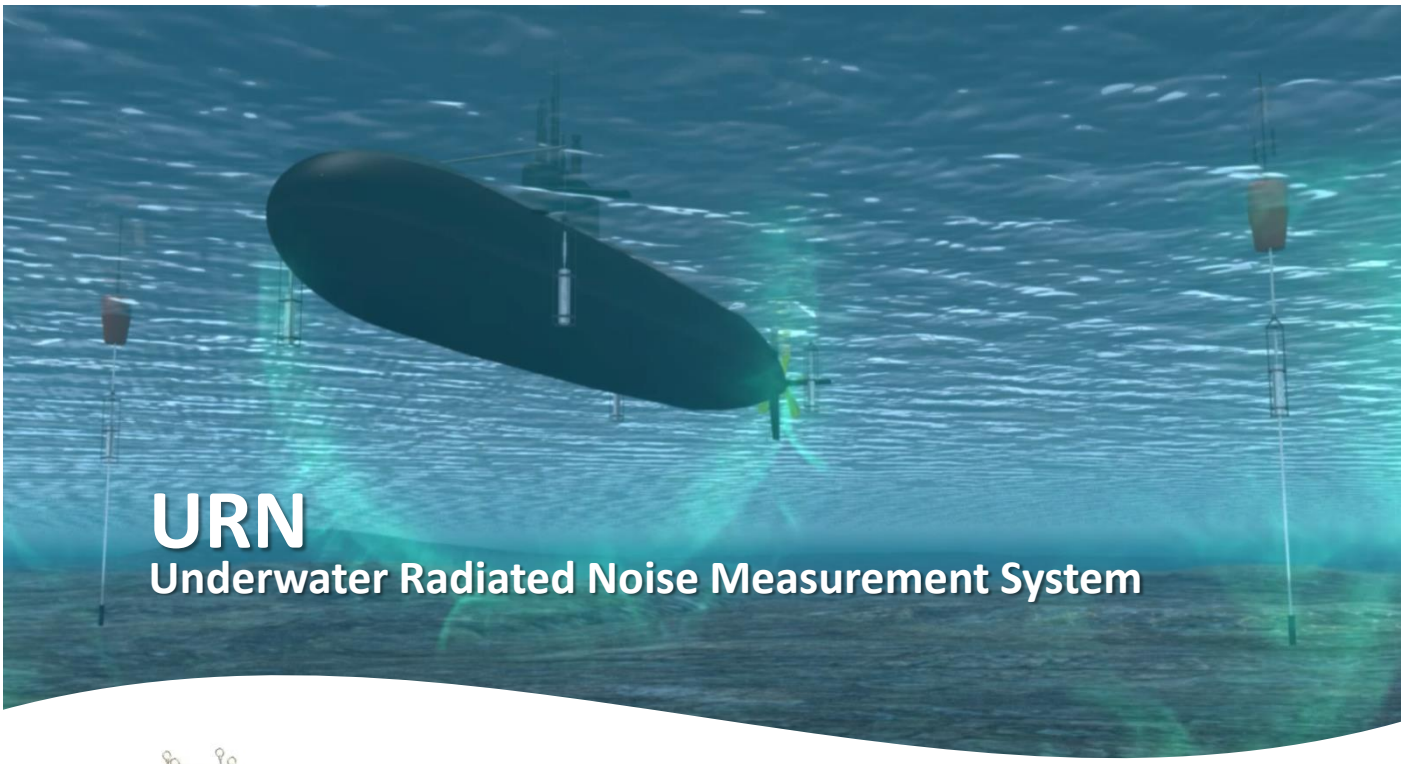
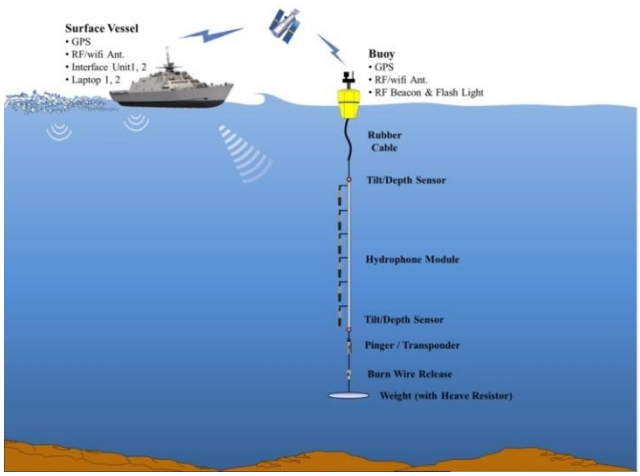


URN
Underwater Radiated Noise Measurement System

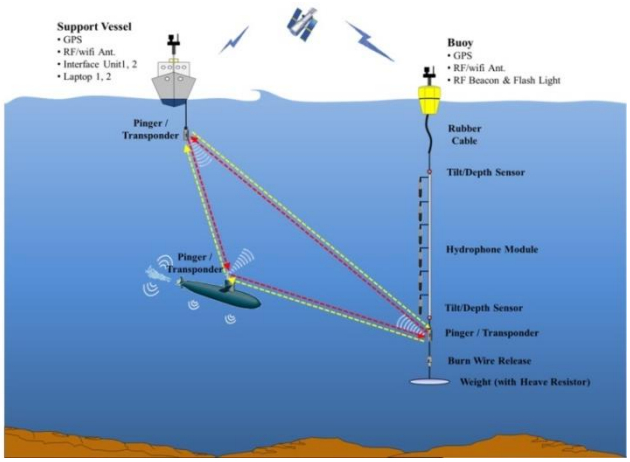
Underwater radiated noise emitted by any self-propelled vessel both surface and underwater is generated during normal operation. Noise from ship has resulted in elevated ambient noise levels in the 10~300Hz frequency range throughout the world's oceans, giving particular concern over impacts on marine life and the marine vessel noise regulation has been strengthening.

Hence in 2015 SonarTech completed the development of its Underwater Radiated Noise Measurement System (URN) using its own sonar technology, and launched in the naval market.

URN measures underwater radiated noise from surface & underwater vessels as they maneuver. It evaluates the noise level by speed, analyses the root cause and judges the phenomenon of propellant cavitation and singing.



URN schematic layout for surface vessel



URN schematic layout for submarine

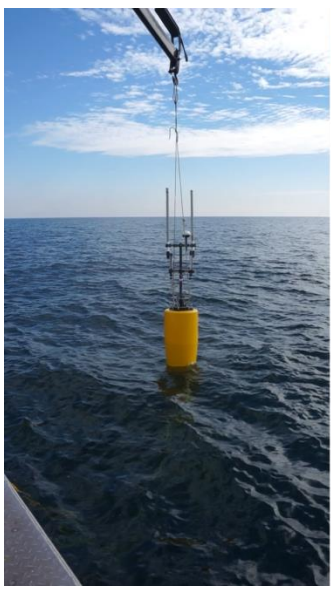
This system is a vertical line array system and consists of array part, buoy part, monitoring part, submarine part and operating software.

Underwater Radiated Noise Measurement
- Vertical Line Array System-

Buoy Part	Array Part	Monitoring Part	Submarine Part
FRP Buoy Body	Hydrophone	GPS Modem & Antenna	RF Modem & Antenna
Battery Module	Hydrophone Module	RF/wifi Modem & Antenna	Interface Unit 4
Signal Processing Unit	Main Cable	Interface Unit 1,2,3	Laptop 1 (Submarine Navigation)
GPS Modem & Antenna	Tilt/Depth Sensor	Laptop 2 (Monitoring & Analysis) Secondary Monitor1 (Navigation Monitoring)	
RF/wifi Modem & Antenna	Pinger		
RF Beacon & Flash light	Electronic Release		
	Rubber Cable		
	Weight		

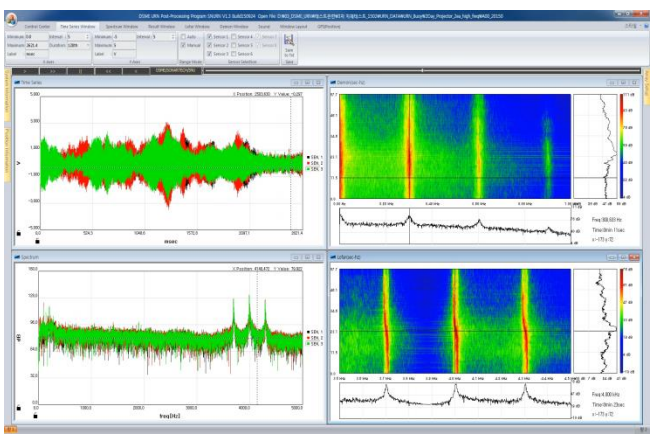
Applications

- The evaluation system of radiated noise for surface warship and submarine
- Improvement of warship stealth design and shipbuilding technology
- Research for low noise vessel according to the marine vessel noise regulation



Key Factors

- Hydrophone: 3~6ch selectable
- Hydrophone Sensitivity: -170dB
- Frequency Range: 10Hz ~ 20kHz
- Tilt/Depth Sensor (optional)
- Pinger(optional): 30kHz, 72 hours operating
- Buoy: Sampling up to 200kHz, 24bit
  LAN, FTP, USB as data backup
- Dynamic Range: 105dB
- Other devices: GPS, RF/wifi Device, Flash light
- Software analysis tool: Octave, FFT, Waterfall, Time & Power Spectrum, LOFAR, DEMON



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