

Weatherproof measurements in arctic conditions

How reliable weather insights are helping the most advanced polar research vessel in the world conduct marine and climate science in Antarctic waters



The client:

Australian Government,
Department of
Agriculture, Water and the
Environment, Australian
Antarctic Division

Vaisala provided:

Environmental Monitoring
System including Maritime
Observation System
AWS430 and Maritime
Observation Console

Australia's new Antarctic icebreaker, RSV Nuyina, has been operational since 2021. The ship is owned and operated by the Australian Antarctic Division of Australia's Department of Agriculture, Water and the Environment, and is one of the world's most advanced polar research vessels. The primary mission of the vessel includes scientific research, resupplying Antarctic stations, and expeditioner transport.

The challenge: Weather measurement technology as tough as the ice

One of the missions of RSV Nuyina is researching and studying climate change in Antarctica so scientists can more accurately predict future impacts and provide information to policy makers and other stakeholders.

RSV Nuyina operates for extended periods in extreme conditions, which demands robust performance of all the equipment and instruments installed on it. A science icebreaker needs an accurate and reliable weather and environmental measurement

solution to support mission-critical activities and stand up to the toughest elements.

The solution: Dependable accuracy in all weather conditions

The Vaisala Environmental Monitoring System is installed on RSV Nuyina. Built on world-class Vaisala sensors and measurement technologies, the Environmental Monitoring System is purpose-built to provide accurate, dependable maritime weather measurements down to the last detail.

The comprehensive solution consists of the Vaisala Maritime Observation System AWS430 and Vaisala Maritime

Observation Console software. Three Vaisala WINDCAP® WMT700 Ultrasonic Wind Sensors measure wind direction and wind speed from the slightest breeze to extremely high gusts. The Vaisala Digital Barometer PTB330 measures barometric pressure, which operators use to track local and regional weather fronts, generate historical models of high- and low-pressure systems, and monitor developing severe weather for an early warning system.

The Vaisala HUMICAP® Humidity and Temperature Probe HMP155 provides humidity and temperature measurement, and the Present Weather Detector PWD22 enables characterization of reduced visibility, precipitation

type identification, precipitation accumulation and intensity measurement, and report formats.

The Vaisala Ceilometer CL31 leverages pulsed diode lidar technology and single lens optics to measure the ceiling and base height of cloud layers. Additional solar radiation sensors or pyranometers and UV-radiometers measure broadband solar irradiance as well as solar radiation flux density on the vessel. In other words, they measure the power of the light and heat from the sun.

All measurement data is collected and displayed in the Maritime Observation Console so operators can take advantage of real-time weather data management tools including reporting, warning alarms and historical data.

**The benefits:
Supporting science to
answer the critical questions
of today**

The Environmental Monitoring System is supporting the researchers and crew on the

RSV Nuyina with accurate and reliable measurements — from studying climate change impacts to collecting data on weather, environmental or atmospheric events, and researching the Antarctic ecosystem.

Equipped with advanced environmental measurement technology, the RSV Nuyina is propelling scientific progress while withstanding the harshest weather conditions in the world.



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