



Australian Government

Department of the Environment

Australian Antarctic Division

Australia's new Antarctic Icebreaker

A Request for Tender (RFT) process is underway for a new multi-purpose icebreaker to replace the *Aurora Australis* as a Southern Ocean science platform and the main lifeline to Australia's Antarctic and subantarctic research stations.

The Australian Antarctic Division of the Department of the Environment is seeking a contractor to design, build, operate and maintain the new icebreaker. It must comply with International Maritime Organisation "Guidelines for Ships Operating in Polar Waters" and will be flagged under the Commonwealth of Australia. Its home port will be Hobart in Tasmania.

The new icebreaker will operate in some of the harshest environmental conditions in the world. It will be built to handle waves up to Sea State 9 (14 metres plus significant wave height), wind speeds up to Beaufort Force 12 (Hurricane), air temperatures ranging from minus 40 degrees Celsius to 45 degrees Celsius, and water temperatures ranging from 2 degrees Celsius below zero to 32 degrees Celsius above zero.

The icebreaker will need to travel extreme distances – Hobart to Mawson, Australia's furthest Antarctic station, is 5475 km – and navigate hazards such as sea ice and icebergs.

**There are two primary missions for Australia's new icebreaker:
resupplying Australia's Antarctic stations and conducting scientific research.**

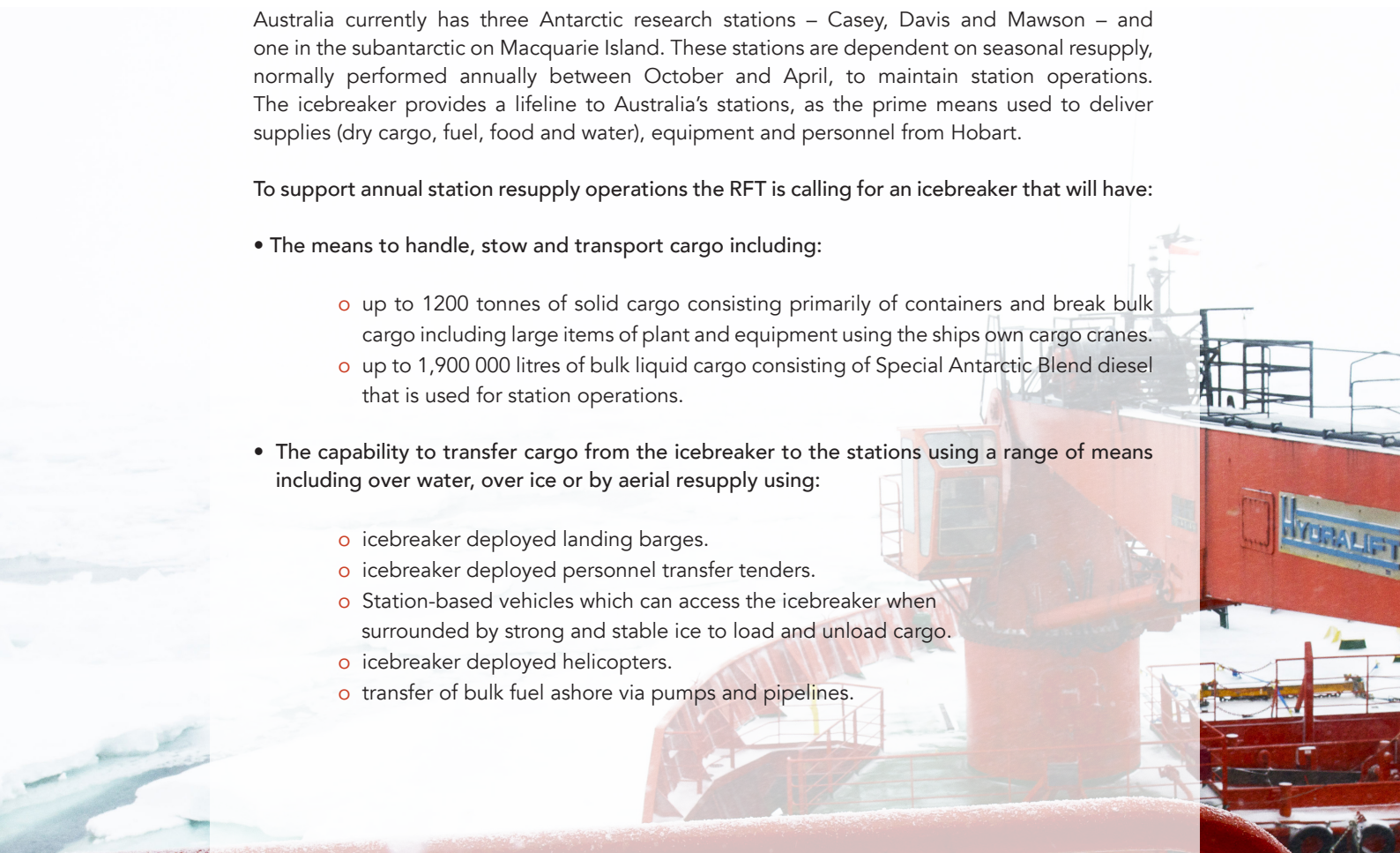
Station Resupply

This involves the delivery of personnel, cargo and equipment to and from the Antarctic and subantarctic stations, mainly from the vessel's home port of Hobart.

Australia currently has three Antarctic research stations – Casey, Davis and Mawson – and one in the subantarctic on Macquarie Island. These stations are dependent on seasonal resupply, normally performed annually between October and April, to maintain station operations. The icebreaker provides a lifeline to Australia's stations, as the prime means used to deliver supplies (dry cargo, fuel, food and water), equipment and personnel from Hobart.

To support annual station resupply operations the RFT is calling for an icebreaker that will have:

- The means to handle, stow and transport cargo including:
 - up to 1200 tonnes of solid cargo consisting primarily of containers and break bulk cargo including large items of plant and equipment using the ships own cargo cranes.
 - up to 1,900 000 litres of bulk liquid cargo consisting of Special Antarctic Blend diesel that is used for station operations.
- The capability to transfer cargo from the icebreaker to the stations using a range of means including over water, over ice or by aerial resupply using:
 - icebreaker deployed landing barges.
 - icebreaker deployed personnel transfer tenders.
 - Station-based vehicles which can access the icebreaker when surrounded by strong and stable ice to load and unload cargo.
 - icebreaker deployed helicopters.
 - transfer of bulk fuel ashore via pumps and pipelines.





Scientific Research

The vessel will be Australia's only icebreaking scientific research platform and will be required to provide a flexible platform to support numerous sample and data collection systems along with associated services and work spaces for analysis and support.

To support scientific research the RFT is calling for an icebreaker that will:

- sustain multidisciplinary and concurrent science operations including support of: sea ice zone research; blue water research, fishery, whale and other marine mammal research; atmospheric, geosciences and other research.
- deploy a range of scientific equipment with precise vessel position and speed control over a wide range of weather and sea conditions.
- survey and operate in a quiet mode with low emitted noise to minimise wildlife disturbance and interference with acoustic instruments.
- support deployment, operation and recovery of:
 - towed and lowered instruments from the surface to the sea floor.
 - instruments and equipment that support atmospheric research.
 - instruments and equipment that support dedicated sea ice research.
- be configured for different science operations between voyages with a range of fixed and portable science laboratories and supporting systems.
- have capabilities including a drop keel, moon pool and aft deck to provide flexibility to support a wide range of different scientific research operations and modes.
- have equipment including a multi-beam bathymetric echo sounder for mapping the seafloor at full ocean depth; sub-bottom profiler to analyse the physical properties of the sea floor; scientific echo-sounders for biomass assessment; fisheries sonar systems; hydrophones and underwater cameras.

Other capabilities of the icebreaker that the RFT asks the tenderers to respond to include:

- a design service life of 30 years.
- availability to support 200 days of usage per season as part of the Australian Antarctic programme (AAP), and up to a maximum of 300 days.
- an efficient cruising speed of approximately 12 knots in open water, a maximum sustained speed of 16 knots in open water, and during icebreaking operations a continuous speed of 3 knots in ice with 1.65 metres thickness.
- an endurance to support voyages for up to 90 days which includes the ability to remain with the Antarctic area for up to 80 days while ensuring a high standard of environmental compliance.
- a range to support station and resupply voyages or to combine station resupply and scientific research activities in a single voyage.
- accommodation for approximately 116 personnel in a combination of single and twin berth cabins and spaces including: theatre; library; dining room; laundry.
- the capability to operate and support four light helicopters or two medium helicopters.
- the capability to deploy and support a range of watercraft, including a specialised tender for marine science.
- an integral specialised medical facility.