

Research Vessel POSEIDON

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Abstract: The research vessel POSEIDON, operated by GEOMAR Kiel, is an important research platform for the marine science community. The knowledge gained from ocean expeditions contributes to a better understanding of the biological, physical, geological and chemical processes in the ocean.

1 Introduction

The R/V POSEIDON was commissioned in 1976 and is owned by the federal state of Schleswig-Holstein. At present, the Briese shipping company in Leer manages the vessel. The R/V POSEIDON is primarily used for long sea voyages, mainly in the Northern Atlantic and its marginal seas as well as the Black and Red Seas. It can remain at sea for 24 days without a port call. The cruising range is 7,000 nm. The home port is Kiel. A basic overhaul was completed in late 2010. The medium-sized multi-purpose research vessel is suited for all disciplines of scientific marine research, in particular oceanography, biology, geophysics, geology and fishery. The research vessel offers accommodation for 11 scientists. This multi-disciplinary concept is to ensure that all science disciplines can work on the vessel as optimally as possible, but does not imply that many different disciplines can be accommodated at the same time, which is to remain the purpose of the global vessels.

2 Technical Data

Owner: Federal state of Schleswig-Holstein, Home Port: Kiel

Operator: GEOMAR Helmholtz Centre for Ocean Research Kiel

Year: 1976 Tonnage: 1105 GT, Draft: 4.9 m

Dimensions: Length: 60.8 m, Width: 11.4 m

Speed: 10.5 knots, Operating range: 7500 nautical miles

Crew: 15 people, Scientists: 11 people

Facilities for the scientific operation: 4 labs 15-30 sqm, 1 vertical shaft, 1 container slot, various cranes,

winches and cables, thermosalinograph, several sounders (deep-sea sounder, multibeam sonar), Data Acquisition System DSHIP, ADCP



Figure 1: R/V Poseidon in the Kiel Bay.

The ship operates with diesel-electric propulsion, i.e. diesel engines drive generators producing electrical current. Two generators supply all the power for the on-board network and the propulsion, a third generator is on standby as back-up. The continuously variable and reversible electrical propulsion motor drives the propeller directly. The vessel features a Gill bow thruster for lateral movements. The water for the Gill bow thruster is taken in underneath the vessel and can be expelled in any direction. R/V POSEIDON is equipped with a stern gallews, a working crane, a jib boom, and a provisions crane. There is also one boom at midships on the port side and one at the stern on starboard. There are 6 winches for scientific operation driven with low-pressure hydraulics. On portside, there is the single-conductor winch (W2) for launching and hauling in devices via a small A-frame. Midships on the bridge deck is the heavy duty winch (W3) for the jib boom, and midships stern on the forecastle are both the mooring winch (W4) and the single-conductor towing winch for the large stern A-frame (W6). A fishing net winch (W7) is located midships stern on the main deck.

3 Facilities for scientific operation

All of the laboratories are located on the main deck. Network sockets for access to the vessel's intranet and internet are available in all laboratories.

3.1 Scientific workstation

The scientific workstation is located midships in the stern bridge section, immediately next to the stern control stand. This position offers good visibility and communication with the nautical crew or during slow profiling, e.g. when towing fishing nets or devices requiring simultaneous monitoring of a sounder (12 kHz).

3.2 Wet laboratory

There is direct access from the wet laboratory to the working deck at a relatively sheltered position. The crane track can be extended from the laboratory through the bulkhead onto the working deck. A swan neck allows loose cables to be routed to the working deck and into other laboratories.

Basic equipment:

- 12 kHz deepsea and pinger sounder with display
- Gyrocompass repeater in DataVis (data for central data capturing)
- Mobile UPS (Uninterruptible Power Supply)
- DataVis, direct output of data groups
- 2 freezers, -20°C, 236 l, 286 l
- Refrigerator, 4° C, 360 l
- Electronic sea chart (repeater)

3.3 Dry laboratory

On-line data capturing occurs mainly in the dry laboratory. Here, the DHCP server for the network is located, the data for central data capturing (DataVis) is merged and distributed, the data for the vessel ADCP, and in most cases, the CTD (Conductivity, Temperature, Depth) data as well is captured. The temperature in the laboratory is regulated via the air conditioner.

Basic equipment:

- Winch display distributor
- UPS
- Vessel ADCP (75 kHz), on-board device and data capturing
- DHCP server and e-mail PC
- Sea chart (repeater)
- Sounder display, 12 kHz deep sea sounder
- CTD probe incl. water samplers, deck unit and data capturing

3.4 Chemistry laboratory

The chemistry laboratory is mainly used to set up systems for marine chemistry work. A small mobile fume hood was procured because a standard fume hood could not be used due to the low ceiling height. The temperature in the chemistry laboratory can be regulated.

Basic equipment:

- Sea water connection (aquarium pump); drain basin
- Connection for mobile fume hood exhaust
- Refrigerator/freezer combination, 4° C, 170 l, -40° C, 80 l volume
- Laboratory basin with warm and cold fresh water, sea water
- Heating cabinet, 50° C – 300° C

3.5 Scientific storage

The scientific storage is located below the portside cargo hatch on the intermediate deck. It has an area of approx. 40m², of which approx. 37m² can be used since an escape hatch and escape path must be kept free. The storage hatch is flush with the work deck and must not be opened at sea. In this situation, the scientific storage can only be reached via a relatively narrow stairway from the main corridor. Therefore, all larger equipment must be placed in the laboratories in the harbour.

In addition, R/V POSEIDON features a number of permanently installed hydro-acoustic systems, including:

- Shallow water sounder (200 kHz)



- Navigation echo sounder (30 kHz)
- Deep sea sounder (12 kHz)
- Electromagnetic speed and Sat log
- Multibeam sounder (50 kHz frequency range up to 3000m waterdepth)