Logistic aspects of the Turkish Antarctic Programme

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Preface

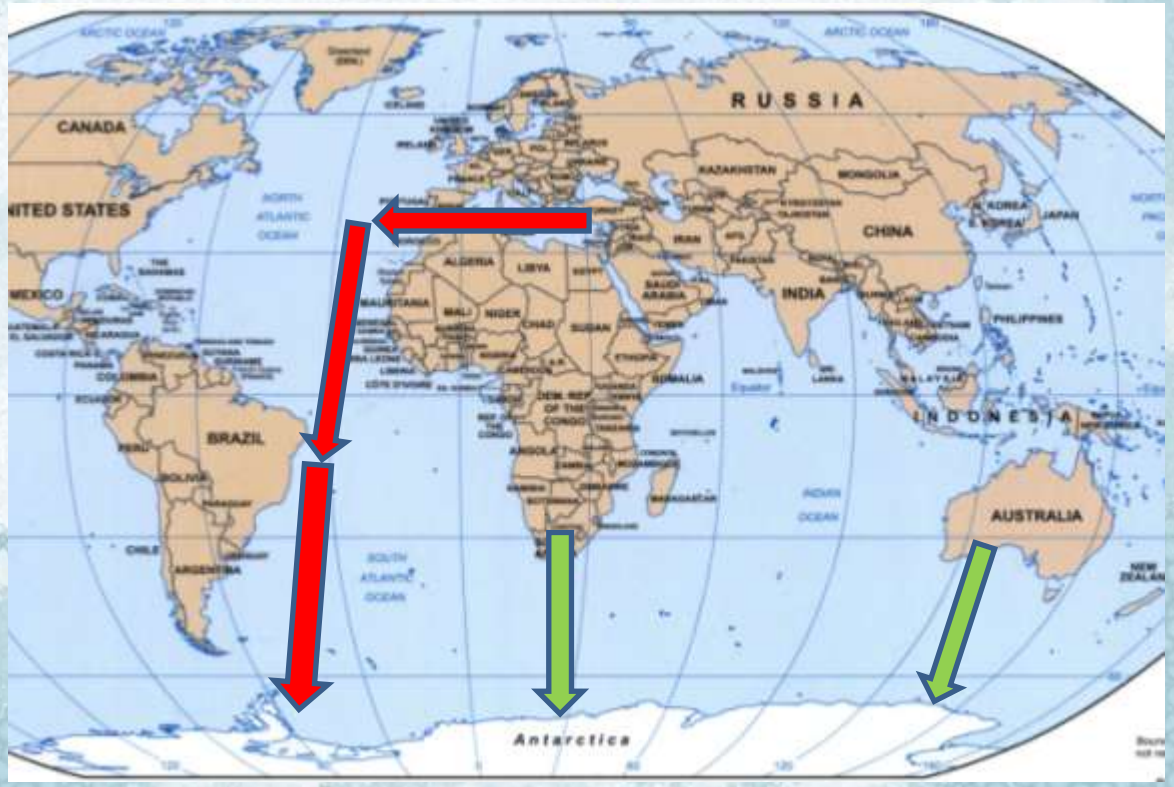
Research Stations in Antarctica

- There are 101 research stations of 29 countries in Antarctica.
- 46 of these are situated on or around the region called Antarctic Peninsula.
- There are 11 countries who do have only 1 research station on the continent. 7 of these have chosen Antarctic Peninsula, which are:

Poland, Brazil, Bulgaria, S. Korea, Peru, Ukraine and Czech Republic

Reaching Antarctica

- Geographically closer countries such as Australia and South Africa, have chosen closer points as the best place for their research stations. For these countries, the distance is around 2.000-3.000 nautical miles.
- The distance between İstanbul and Antarctica is around 8.000 nautical miles and takes around 30-35 days by ship.



Reaching Antarctica

- Most of the countries use harbors of the nearest countries such as Argentina and Chile for logistic supply.

- Turkish Polar Research Vessel is planned to have a single journey each year from Turkey to the Station but several logistic support missions from Argentina or Chile. This short voyages are around 800 nm and take 3-4 days to cover.

Reaching Antarctica – Cargo Transportation

- Within the annual voyage from Turkey to the station, high volume and heavy goods such as infrastructural goods; food and consumables, especially energy source fuel is supposed to be transferred to the Research Station.
- For these reasons, the Turkish Polar Research Vessel should have a capacity of at least;
  - 1.000 tons of cargo fuel;
  - 400 m^3 logistic supply;
  - 50 tons of helicopter fuel – JP5;
  - 32 TEU containers.

Ship’s crew and capacity

- There will be 1 captain, 1 chief engineer, 4 deck and 4 engine officers, 10 engine and 10 deck crew; which makes a total of **30 seamen**.
- Additionally, **2 crew** for helicopter operations and **16 scientists** for seagoing research. Extra berthing for passengers (or Scientists to be transferred to the station) is **22 person**.
- **TOTAL CAPACITY: 70 kişi**

Turkish Polar Research Vessel

Mission Area:

Primarily, Antarctic Peninsula and neighboring seas such as South Atlantic Region and South American Pacific Coasts.

Although the primary mission are is defined as southern regions, the vessel will have Mediterranean Voyages twice a year.

The vessel can be used for Arctic voyages.

The vessel will make logistic support voyages between the station and closer ports of Chile and Argentina such Punta Arenas.

Turkish Polar Research Vessel

The investment need for the realization of this vessel is around 200 million USD, including all auxiliary vessels and scientific equipment. The daily running costs for this research ship is approximately around 40,000 USD.

Project period: 2014-2020

Total Budget: 180 - 240 million USD

Yearly Budget (for 200 million USD):

2014	2015	2016	2017	2018	2018	2019
2m USD	2m USD	42m USD	40m USD	40m USD	38m USD	36m USD

Project plan (optimistic):

- 2014: Concept definition, technical specifications, basic design
- 2015: Design, Model testing, prequalification of yards, call for tenders, contract negotiations
- Early 2016: Contract
- Early 2019: Trials/Delivery
- Late 2019: First regular science cruise

Case: South Korean Reserch Vessel – RV Araon

- The **RV *Araon*** is a large icebreaker operated by the Government of South Korea. The vessel was commissioned in 2009. She supplies the King Sejong Station, and will supply the Jang Bogo Station, South Korea's second planned Antarctic research station.

Case: South Korean Reserch Vessel – RV Araon

Operator:	**Korea Polar Res. Inst.**
Builder:	Hanjin Heavy Industries
Cost:	108 billion won
Laid down:	May 2008
Completed:	September 2009
General characteristics	
Tonnage:	6,950 GT
Length:	109.5 m
Beam:	19.0 m
Ice class:	KR PL-10 (DNV Polar-10)
Installed power:	Diesel (2×5,000 kW)
Propulsion:	Diesel-electric Two azimuth thrusters Two bow thrusters
Speed:	12 knots (service) 16 knots (max)
Range:	20,000 nautical miles
Endurance:	70 days
Crew:	25 - Up to 60 scientific

Current Vessels – RV Barbaros Hayreddin Paşa (Ex: Polarcus Samur)

Owner	**Turkish Patroleum Corp.**
Completed:	March 2011
General characteristics	
Tonnage:	4,711 GT
Length:	84.2 m
Beam:	17.0 m
Ice class:	ICE-1A (Arctic ready)
Installed power:	Diesel engines (4×3,060 kW)
Speed:	17 knots (max)
Capacity:	53

Current Vessels – RV TURKUAZ (To be delivered in 2015)

Owner	**Turkish Mineral Research Corp.**
Completed:	2015
General characteristics	
Tonnage:	4,500 GT
Length:	90 m
Beam:	20.0 m
Ice class:	-
Installed power:	Diesel engines (4×2,560 kW)
Speed:	18 knots (max)
Capacity:	50

Turkish Antarctic Research Station Infrastructure

The most important subject, affecting the infrastructure of TARS is the geographic location. As a result of the former negotiations; the area of Antarctic Peninsula including the surrounding islands are considered as the most convenient area in this topic. The selection of the correct situation is mostly related with:

- Scientific interest (Climate change, long-term year-round monitoring)
- International Collaboration
- Accessibility (Safety, sea ice, ice runaway)
- Construction (sufficient space, basement stability)
- Economics of construction and operation (running-cost)
- Environment (Protection, ecosystem, weather)

Turkish Antarctic Research Station Infrastructure

For an efficient evaluation;

- Turkish scientists should visit **6-8 candidate** places and choose **2 key areas** for the station according to scientific interest.
- An intensive site survey should be conducted by at least **20 scientists and engineers**; which will take around 2 months to complete.
- As a result of a deep technical evaluation of all aspects supported by a cost-benefit analysis, the **exact location** will be decided.

Turkish Antarctic Research Station Infrastructure

Project period: 2014-2020

Total Budget: 80-120 million USD

Yearly Budget: **(for 100 million USD)**

2014	2015	2016	2017	2018	2018	2019
2m USD	6m USD	10m USD	12m USD	20m USD	40m USD	10m USD

Case 1: South Korean Jang Bogo Station

Case 2: Spanish Juan Carlos 1 Station

- Being operated since 1988 on Livingstone Island in Antarctica
- Second largest island in the South Shetland Islands, to the north west of the Antarctic Peninsula.
- Winter temperatures drop to around -25C and in summer rise to an average 2C

Case 2: Spanish Juan Carlos 1 Station

- Logistics are managed through Ushuaia in Argentina and Punta Arenas in Chile, both of which are 4 days sailing away.
- The base currently provides accommodation for a maximum of 20 people and is constructed using containerised and modular igloo accommodation.
- The new base will comprise a habitat module, separate science module and a series of support modules for services and storage.
- The habitat will provide sleeping accommodation for 24 people, with the option to increase the population to 48 in the future.

Result- 1

Building of a multi-role vessel will support Antarctic Voyages as well as other scientific missions on Turkish Territorial Waters for seismic, geologic, hydrographic, oceanographic and hydro-acoustic researches. So the optimum design will have a **limited ice-breaking** (like Polar Class 5) but an **extensive research** capability. This will be the optimum solution regarding the initial investment and operation costs.

Result- 2

In parallel to the ongoing strategic planning studies; in order to undertake the logistic support roles of the Future Turkish Antarctic Research Station nationally, enough funds should be allocated as soon as possible to initiate the studies for pre-design and feasibility of the required Turkish Polar Research Vessel.

Need to mention that, delivery of a such vessel will optimistically be 6 years after the initiation of this feasibility study.

Thank You… Questions?