Project: HSC “Okyalos”

"Okyalos" is the one who can travel at high speed on the water.

"Okyalos" was the ship of Odysseus in Homer’s Odyssey.

Anastasios Papavasileiou
boats@okyalosmil.gr
www.okyalosmil.gr

Okyalos

- Okyalos I
- Okyalos II
- Okyalos III

EMAL SA

1. Quality management systems according to ISO 9001:2008
2. Member Association of Greek Aluminum Manufacturers (S.E.K.A.)
3. Awarded the Greek quality label frames Q. System 2: 2007
4. Located Industrial area of Athens (Oinofyta) and cover 4000 m^2
5. Main activities of the company are:
   Aluminum frame structures for buildings from 1983.
   "Okyalos" High speed aluminum crafts from 2013.
   "Ermioni HSC Seats" from 2015.

Okyalos I: Prototype

➢ The first Okyalos Vessel was launched, successfully tested and delivered to the Hellenic Navy in June of 2015.

Greek Navy

VIDEO 1

VIDEO 2

VIDEO 3

General characteristics

- ✓ Overall Length: 13.60m
- ✓ Ship Length (LOA): 12.60m
- ✓ Breadth b: 3.15m
- ✓ Draught (DWL): 0.70m
- ✓ Maximum Fuel Capacity: 1,100lt
- ✓ Crew Members: 4
- ✓ Maximum Speed: 45 knots.
- ✓ Maximum Range (at 40knots): 300nm.

Okyalos II

General Description

- High Speed Craft (HSC)
- Evolution of Okyalos Prototype
- B Category
- Sea state 4/6
- Overall Length: 15m
- Weight: 12tn and 10.5 tn
- Crew Members: 14 (Model Open 14) – 10/12 (Model Closed 10)
- Maximum Speed: 50 - 55kts
- Range at Operational Speed: 350nm

Specifications

The design of the craft will meet the rules and regulations of the French Shipping Register Bureau Veritas . The basic regulations which will be accompliced are:

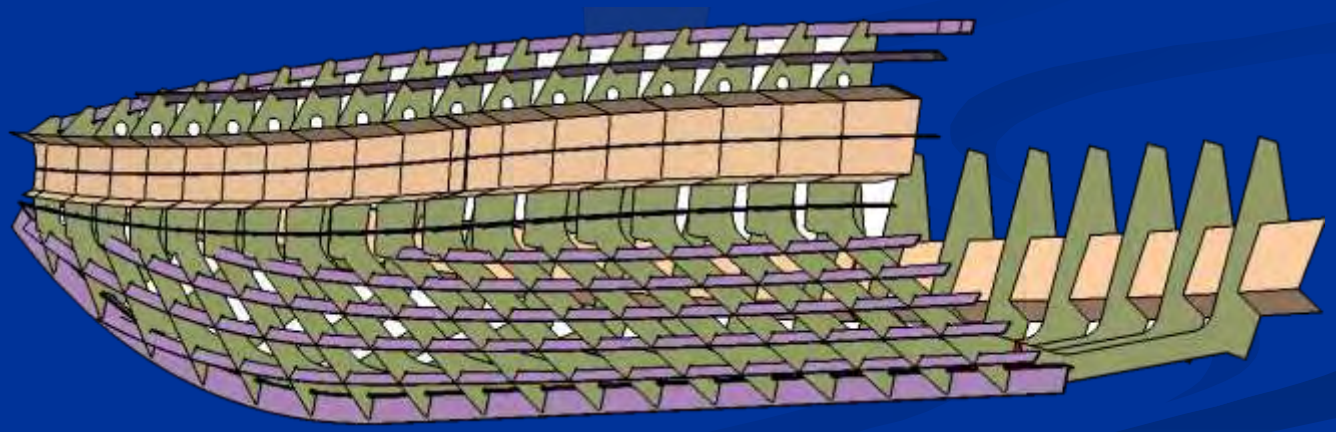
- NR 396_2002-02-Rules for the Classification of High Speed Craft
- NR 467_2014-07-Rules for the Classification of Steel Ships
- NR 561_2012-03-Hull in Aluminum Alloys
- NR 600_2014-07-Hull Structure and Arrangement for the Classification of Cargo Ships less than 65 m and Non Cargo Ships less than 90 m.

BUREAU VERITAS 1828

BUREAU VERITAS

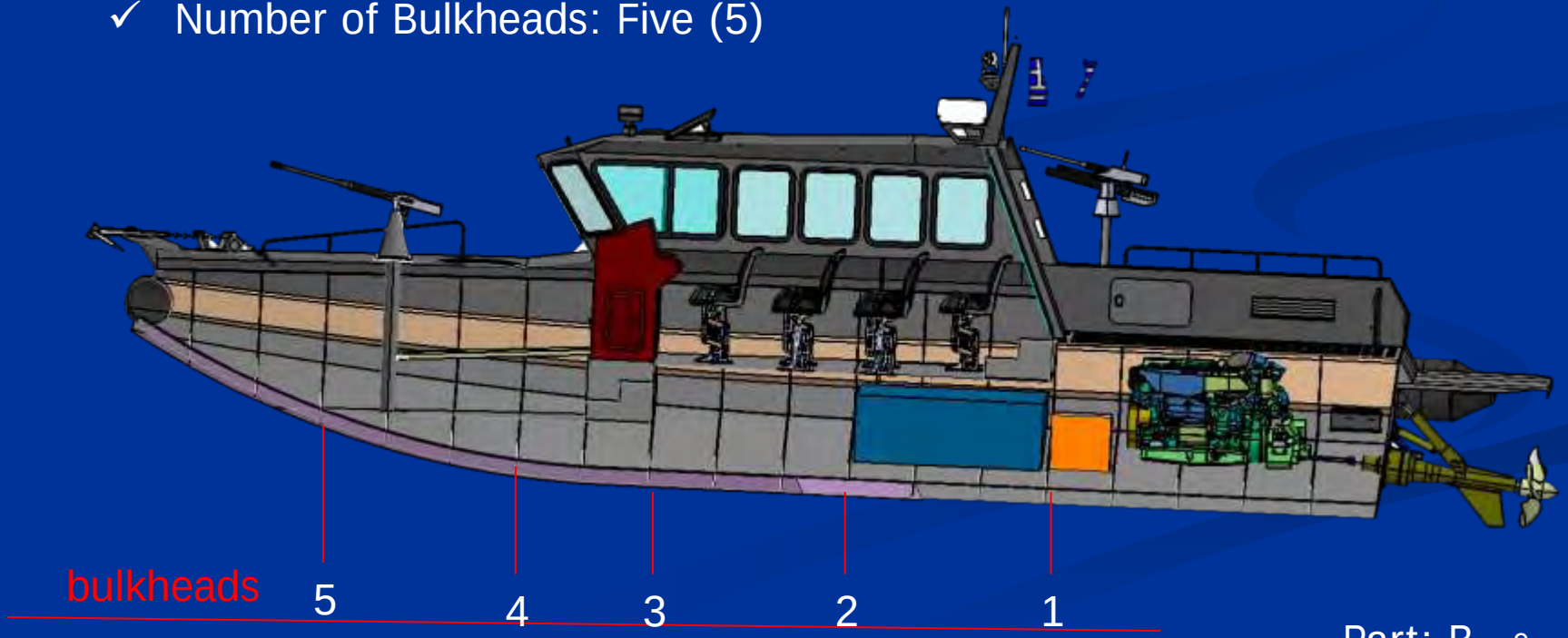
Structure

- Hull Type: Monohull (Hard Chine Hull)
- Hull Shape: Deep V, 23.5deg
- Two Pairs of Water Resistant Keels (Spray Rails, Strakes).
- Construction Materials: AL. Alloys 5083 & 6082
- Structural Configuration: Combination of Frames and Longerons



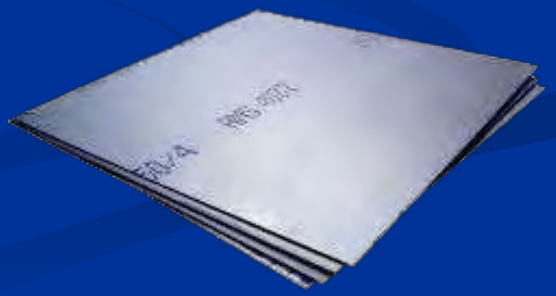
Structure

- Compartments:
  - ✓ Engine Room
  - ✓ Fuel Tank
  - ✓ Passenger Cabin (Closed 10)
  - ✓ Cockpit
  - ✓ Cargo Hold – Storage Area
  - ✓ Bow Water-Tight
  - ✓ Number of Bulkheads: Five (5)



Why Aluminum?

- **Life Limit**
- **Weight – Fuel – Speed**
- **Impacts**
- **Sun Exposure**
- **Recyclability**
- **Fire Resistance** (British Standard BS476)
- **Delamination**
- **Maintenance**
- **Raw Material Origin**



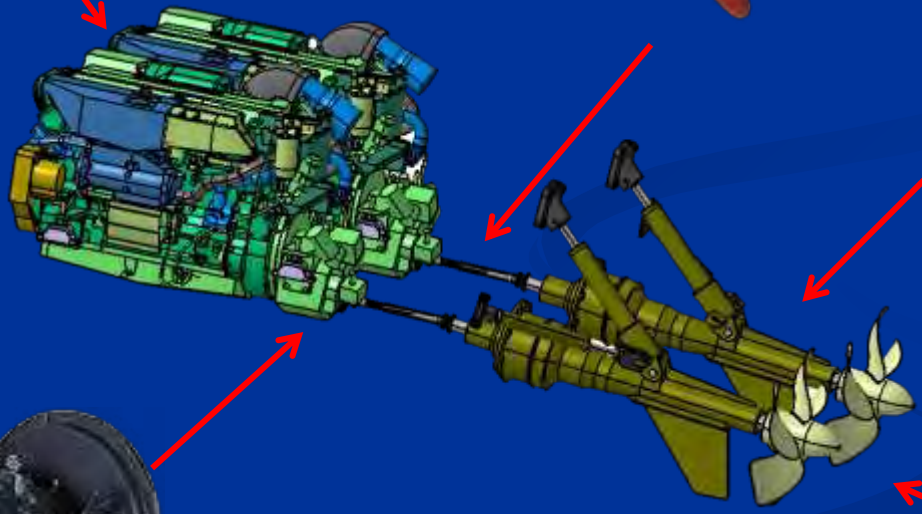
Thrust

Volvo Penta
D11-670

EC 300

CARDAN

ASD 11S

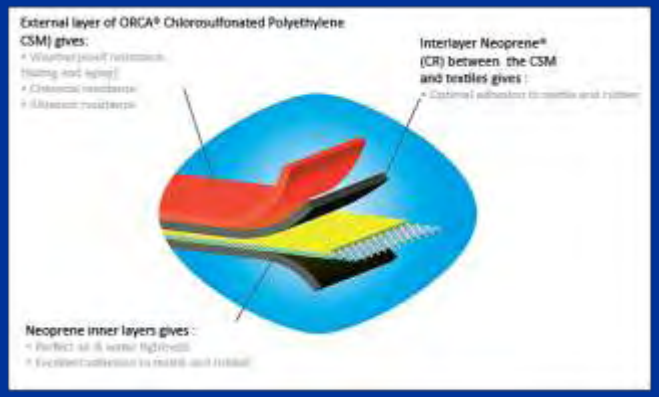


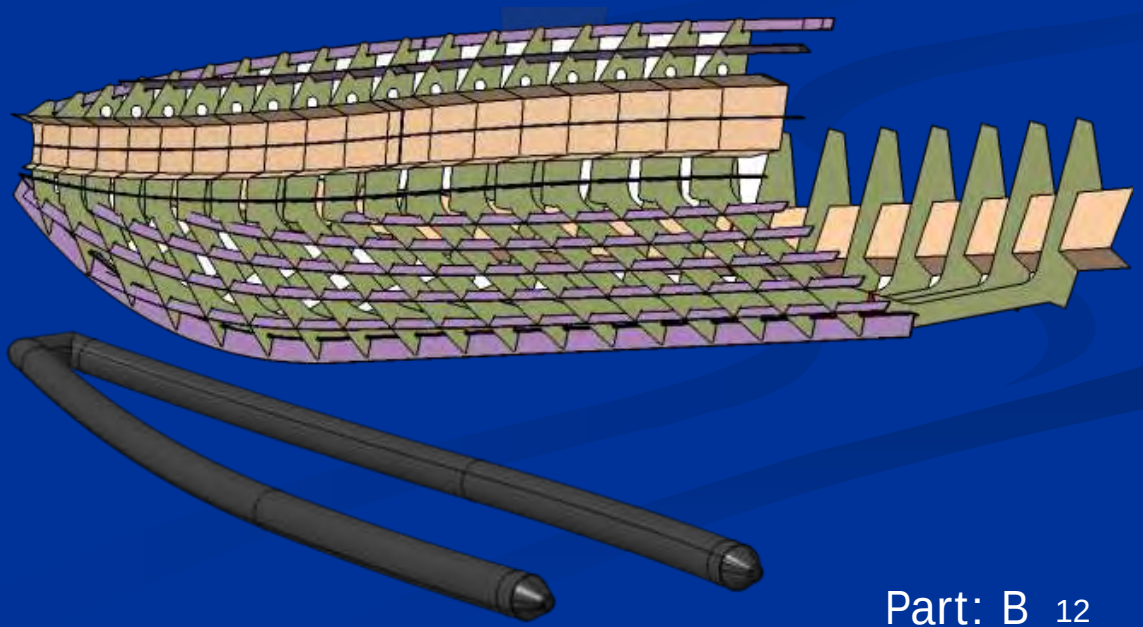
MGX-5065A

ROLLA

Tubes

- Tubes: Five chambers (each side)
- Diameter (Average): 60cm.
- Construction Material: ORCA 866 Nepture 1670 dtex Grey Cloth
- Breakwaters: Two Sets (Dimensions: 90x24mm)
- Antislip Clothing: All over the upper part of the tube.
- Cruising capability even without the use of tubes.





Armament Systems

- Weapons
  - ✓ Bow & astern deck structural reinforcement for mounting the gun (the type & configuration of reinforcement depends on the type of gun selected)
  - ✓ Suggested configuration: Front 0,50" X1, Rear: 7.62mm X 2.

- Armoring (optional)
  - ✓ The vessel could be modified in order to obtain protection 7.62x39 AK47 MSC.

Maintenance

- **Warranty**
  - ✓ The metal structure is covered with a warranty of two (3) years from the manufacturer.
  - ✓ The remaining electromechanical equipment covered by the guarantee provided by the individual subcontractors with a minimum one (1) year guarantee.

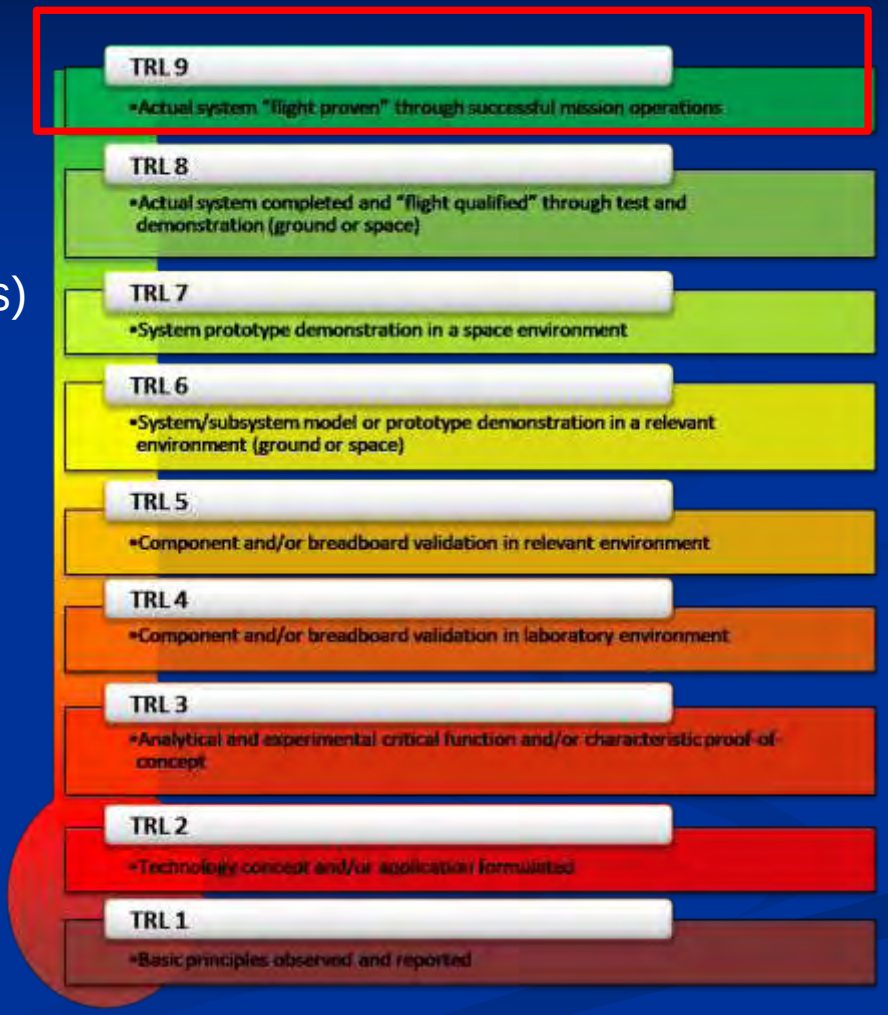
- **Maintenance**
  - ✓ The boat maintenance is divided into scheduled and unscheduled determined by the manufacturer and the subcontractors.
  - ✓ Indicatively, the anodes and hull painting (antifouling) should be mandatory serviced every two years while all other parts board should be serviced according to individual subcontractor's directives.

Missions

1. Sea Border Surveillance and Patrolling
2. Broad Land and Sea Areas Surveillance
3. Coastal & Maritime Surveillance
4. Critical Infrastructure Inspection
5. Physical Disasters Monitoring
6. First Responders / Emergency Management
7. Search & Rescue Operations Support
8. Sea Traffic Surveillance
9. Anti-Terrorist and Law Enforcement Operations Support
10. Anti-Smuggling Surveillance
11. Natural Resources Monitoring
12. Scientific Research
13. Damages and Natural Disasters Assessment
14. Emergency Personnel Response / Rapid Personnel Evacuation
15. Teams Transportation (e.g. special forces teams)
16. Force / convoy protection
17. Marine Safety
18. Communications relaying
19. Communications Intelligence (COMINT) / Electronic intelligence (ELINT)
20. Electronic Warfare (EW)

Advantages

1. Top quality aluminum
2. Classification
3. Miniature frigate
4. Fine design
5. Customization
6. Long-time lifespan (min 30years)
7. Recyclability
8. Bulkheads
9. Inflatable tubes
10. Thrust system
11. Fuel tanks
12. Battle damage repair
13. Maintenance
14. Manufactured in Europe



Resources

1. Electrical engineers
2. Electronic engineers
3. Mechanical Engineers
4. Naval engineers
5. Welding engineers
6. Simulation programs
7. Design programs
8. CNC Equipment
9. Welding machines

1. In house: 2.000.000
2. Outsourcing: 1.300.000€
3. Duration: 2 years

Future plans

- Autonomous Control & Remote Command Systems / Unmanned Sea Vehicle (USV)

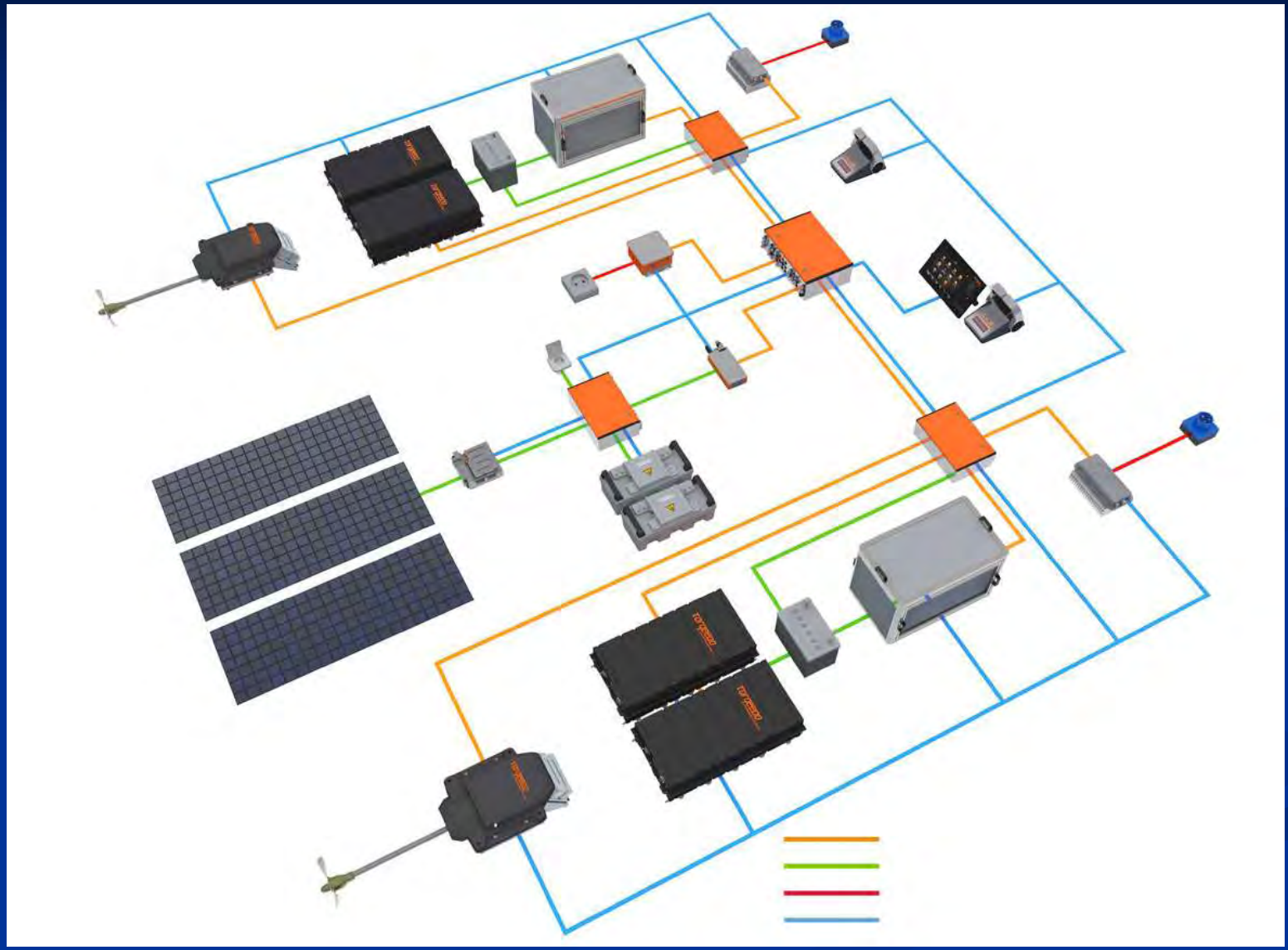
- Hybrid Systems (Electric propulsion – Diesel)
  - ✓ Hydrogen Internal Combustion Engine (HICE)
  - ✓ Solar panels

- Advanced communication systems
  - ✓ TALONS

- Mothership for drones:
  - ✓ UAV (Unmanned Air Vehicles)
  - ✓ Helicopters
  - ✓ USV (Unmanned Sea Vehicles)

Okyalos III

Okyalos III



Okyalos III

Motor types

Inboard

Saildrive

Outboard

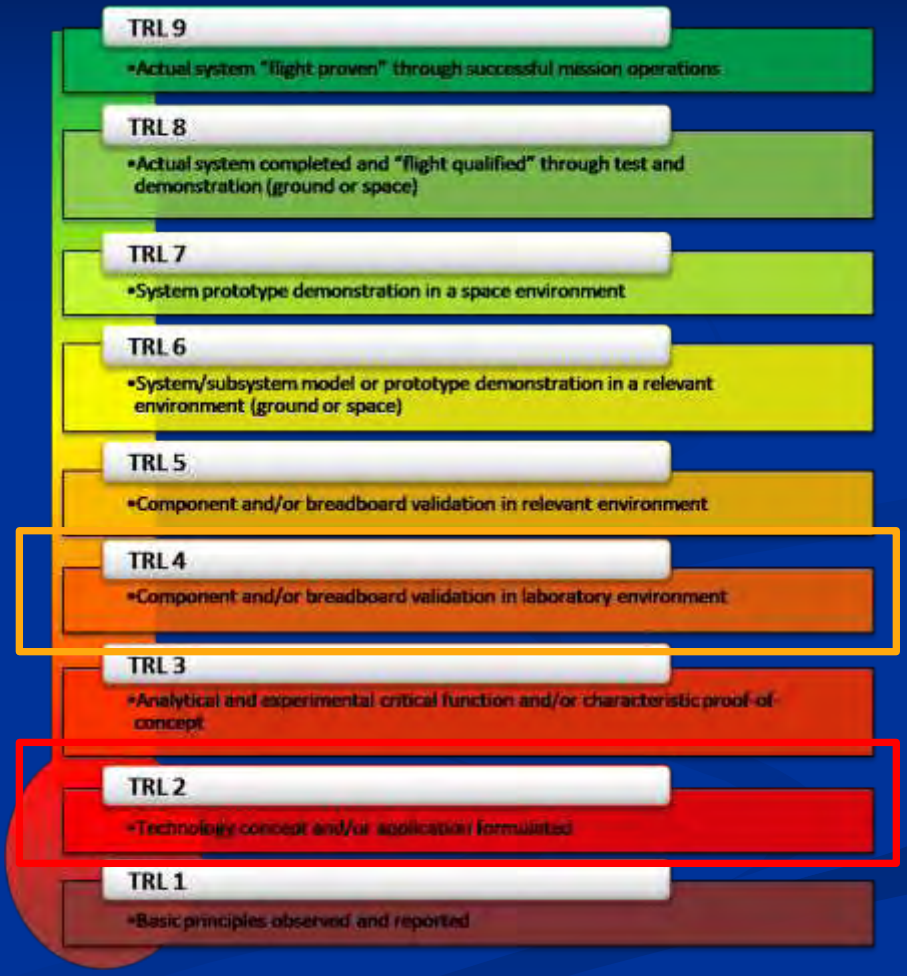
Motor performance	Deep Blue 40	Twin Deep Blue 40	Deep Blue 80	Twin Deep Blue 80
Output (peak)	33 kW	65 kW	65 kW	130 kW
Output (continuous)	27 kW	55 kW	55 kW	110 kW
Weight (including motor electronics)	88 kg	176 kg	88 kg	176 kg

Generators	20 kW
Output (peak)	25 kW
Output (continuous)	20 kW
Weight (including housing)	275 kg

Batteries	Deep Blue High-voltage Battery	Power 26-104 (24 V on-board power supply)
Battery type	Li-ion	Li-ion
Capacity	12.8 kWh	2.7 kWh
Voltage	345 V	26 V
Charge	40 Ah	104 Ah
Weight	147 kg	24 kg
Parallel connection possible	Yes, up to 16 batteries per drive	Yes, up to 16 batteries per battery bank

Advantages

1. State of art
2. Full Central control
3. Range
4. Maintenance
5. Fuel Consumption
6. Long-time lifespan
7. In country technology



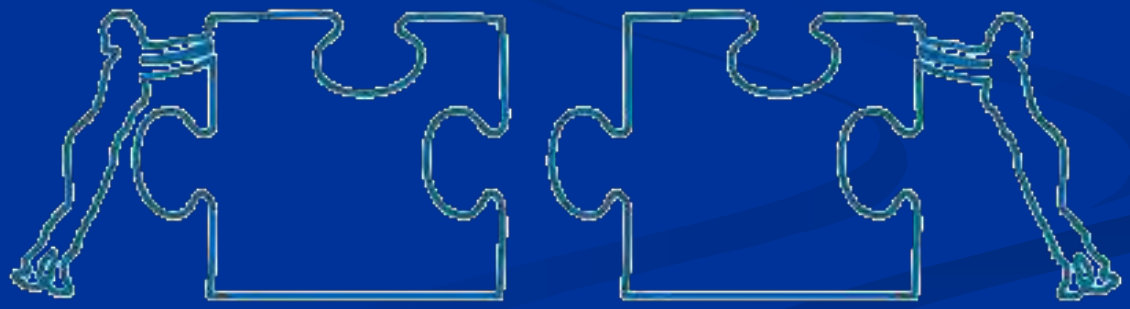
Resources

1. Electrical engineers
2. Electronic engineers
3. Mechanical Engineers
4. Naval engineers
5. Simulation programs
6. Design programs
7. CNC Equipment
8. Water test tanks
9. Data acquisition systems

1. In house: 2.500.000€
2. Outsourcing: 2.000.000€
3. Duration: 3.5 years

Areas Of Cooperation

- Communications systems
- Weapon systems
- Autonomous Control technology
- Drones
- Electric Engines
- Data acquisitions
- Hydrodymanics



Okyalos

Questions ?