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- **EFFICIENCY, RESILIENCE AND TOOLING:**
- **THE RISING OF HYBRID ROVS IN HEAVY OFFSHORE OPERATIONS**

HOYTEK
hoytek.com.tr

Brief History & Background

HOYTEK

Founded in 2015

Team of 25 people

Delivered more than 30 ROVs



3 Drill Support WROVs with Turkish Petroleum over 25,000 hours each with no downtime in the last 3 years

14 Observation Class Demre ROVs delivered to Police, Coast Guard

1 light work class ROV for archeological research

Lego type structure: mini to WROVs use same electronic components and subsystems

Durable design, good service

HYBRID ROVS



- A **Hybrid** ROV is a relatively new type of a remotely underwater vehicle
 - utilizes a full electric thrust system and a hydraulic tooling system at the same time
 - Each electric thruster >200kgf
 - HPU enables use of legacy tooling equipment



HYDRAULIC ROVS

A Hydraulic ROV is a type of a remotely underwater vehicle which utilizes a full hydraulic system with hydraulic thrusters and hydraulic tooling

- ❖ Higher Power Density
- ❖ Low Initial Costs
- ❖ Oil leak can not be avoided
 - ❖ Water in the system – whole system needs to be flushed
- ❖ Costly and messy maintenance
- ❖ HPU single point of failure

PROS OF HYBRID SYSTEMS



❖ Simplicity

- Less Complex Parts – All thrusters and subsystems are decoupled
- Easy and Quick Maintenance - Very little oil in thrusters, pump oil into compensators when oil level is low
- HPU runs much less frequently – less maintenance and longer lifetime

❖ 50% More Efficient

- ❖ Does not overheat in shallow or in warm waters

❖ 25-30% More Compact

❖ Up to 50% Lighter – Compact LARS and TMS possible

❖ Eco Friendly

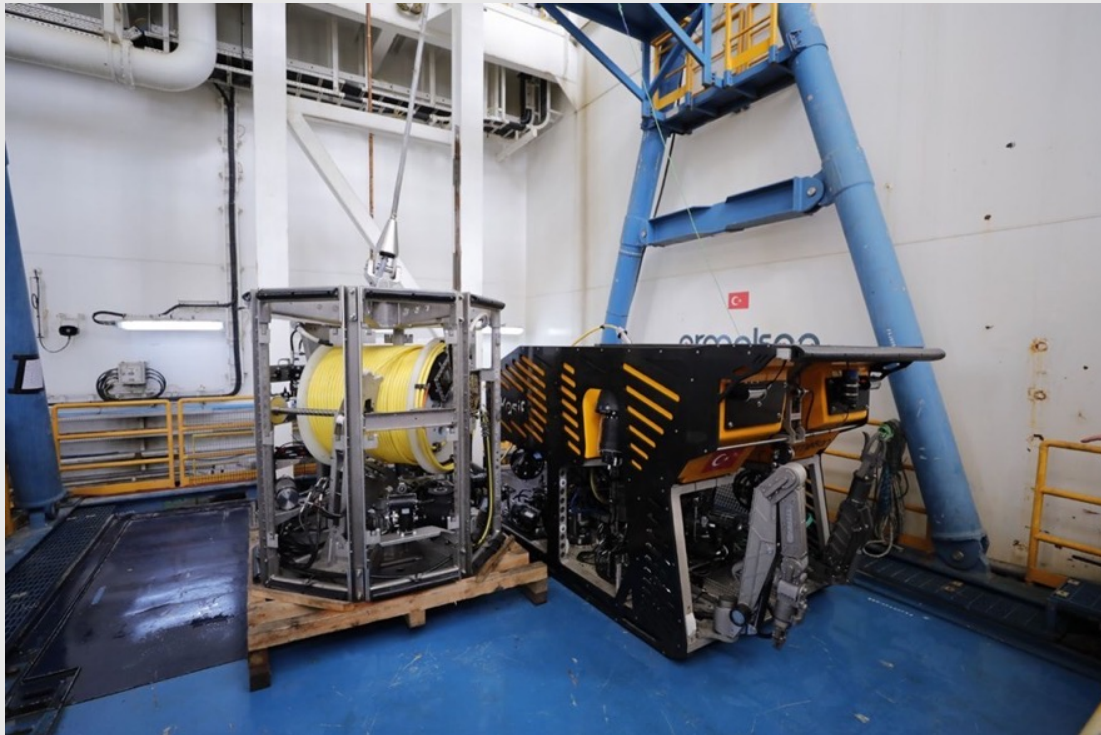
- Much Less Fluid Leaks
- Quieter & Less CO2 Emissions

❖ Better Data From Controllers

- Motor, Diagnostic Data
- Feedback – Very smooth ROV operation

❖ Cheaper in the Long Run, much lower Lifetime Cost

HOYTEK LYRA: HEAVY WORK CLASS HYBRID ROV



Lyra is designed to be used in operations requiring power and precision such as drilling support, pipeline inspection and intervention, scientific sample collection, exploration, search and rescue, and underwater construction.

- ❖ 3000m Depth Rating (6000m optional)
- ❖ Schilling T4 ve RigMaster Manipulator Support
- ❖ Heavy Duty Tooling Support
- ❖ Weight: 3800kg
- ❖ Dimensions: 2.8 x 1.8 x 1.7m (LxWxH)
- ❖ Standard Payload Capacity: 200kg (After manipulators and HPUs installed)
- ❖ Forward Thrust: 800kgf
- ❖ Lateral Thrust: 700kgf
- ❖ Vertical Thrust: 700kgf
- ❖ Fully Customizable

3.000m Depth Rated WROV Kaşif



7f Manipulator

>200 kgf

API-53 Compatible

≈ 250 HP

**75kW Dual Pump
HPU**

5f Manipulator

HOYTEK LYRA: HEAVY WORK CLASS HYBRID ROV: Our Experience



- ❖ Field Proven!
- ❖ 25,000 Hours of 7/24 Operation
 - ❖ 0 hours of Downtime – Much faster maintenance cycle
- ❖ Strongest in its Class
- ❖ Completed Every Single Drill Support Operation
 - ❖ Galaxy tool
 - ❖ BOP shear ram closing wrt API 53 standard
- ❖ Reliable and Easy Maintenance
 - ❖ No single thruster failure in last 4 years with 3 WROW at work
- ❖ HPU is not needed to work all the time
 - ❖ Much less HPU maintenance compared to Hydraulic ROVs



Kosif - 1

**Fatih
Drill Ship**



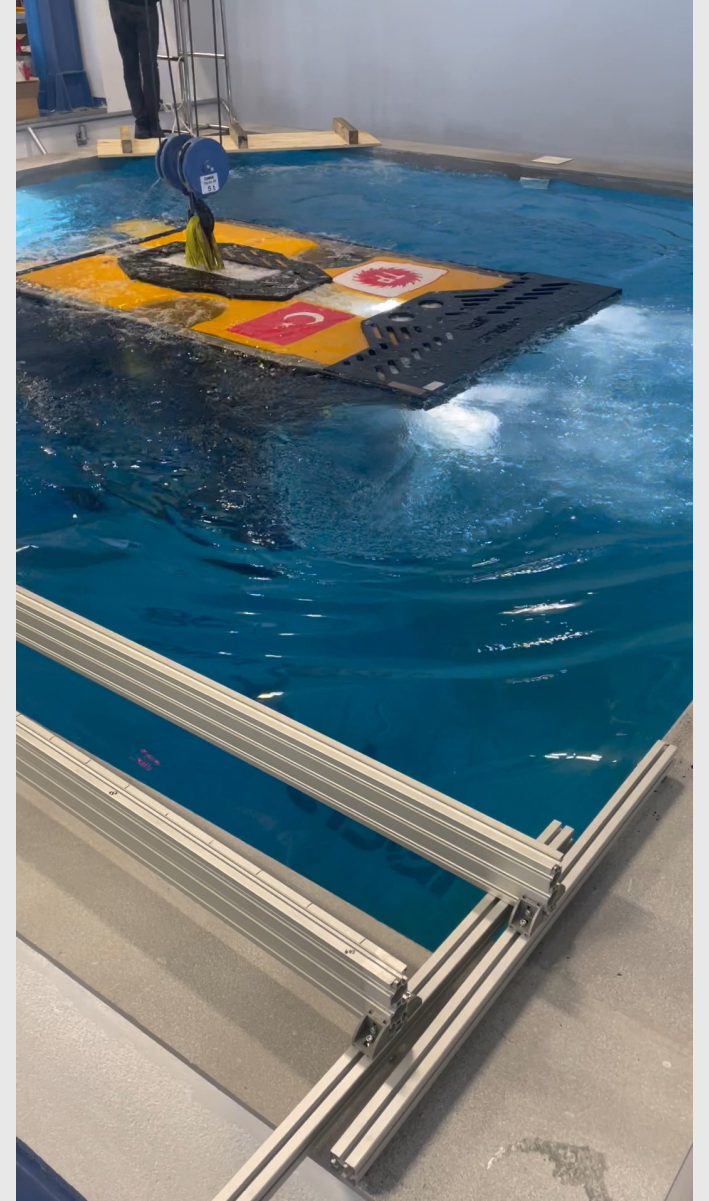
Kosif - 2

**Kanuni
Drill Ship**



Kosif - 3

**Abdülhamit Han
Drill Ship**



The image shows an underwater video feed with several data overlays. At the top left, the 'armelson' logo is visible. The top center features the number '196' in a red box, with 'S' to its left and 'SW' to its right. Below this, the text 'TURKALI-3' and 'KASIF-1 BOP OPERATIONS' is displayed. On the right side, 'Auto DPT' is shown above a vertical depth scale with markings at 2100, 2120.9 (in a red box), and 2150. At the bottom right, 'ALT' is shown above a vertical scale with markings at 100, 0, and 000.0. In the bottom left corner, the following text is displayed: 'Dive 118', '11.07.21', and '07:15:09'. The central part of the image shows a yellow buoy with 'TURKALI-3' written on it, suspended in the water. A white cylindrical object is visible in the lower foreground.

armelson

S 196 SW

TURKALI-3

KASIF-1 BOP OPERATIONS

Auto DPT

2100

2120.9

2150

ALT

100

0

000.0

Dive 118

11.07.21

07:15:09

HOYTEK LYRA: HEAVY WORK CLASS HYBRID ROV





HOYTEK

THANK YOU!

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