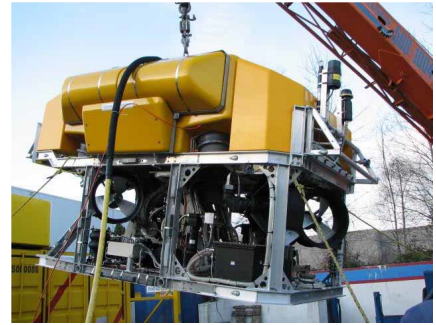


Remotely Operated Vehicles (ROV): Hydraulic vs Electric



ISE has invested extensive research and development resources to evaluate the benefits of electric thrusters for work-class ROV. The main driving force behind the desire to utilize electric thrusters is to eliminate the piping losses that are inherent to hydraulic systems. ISE has found that the drawbacks of utilizing electric thrusters does not outweigh this potential gain in efficiency.

The following list outlines the major benefits of hydraulic thrusters versus electric thrusters:

1. Thruster motor size – typically electric motors must be housed in oil filled enclosures which results in a much larger motor size compared to a hydraulic thruster motor. This increase in motor size obstructs the flow on one side of the thruster nozzle creating a thrust bias – the thruster will exert more thrust in one direction than the other.
2. Robust – in the event of a leak, a hydraulic thruster will continue to function, even when completely filled with seawater. An electric motor in the same situation would short out and fail.
3. Available power – in a hydraulic ROV there is more power available for other tasks. For example: If a 100hp hydraulic vehicle is operating in calm water and is only using 10hp to station keep (a realistic scenario) the remaining 90hp is available for tooling and auxiliary operations. An electric vehicle is limited to the size of the auxiliary HPU and cannot transfer thruster power to auxiliary tasks.
4. Off the shelf components – the hydraulic motors at the core of an ISE thruster are off the shelf hydraulic motors utilized in numerous applications around the world. They are field tested, readily available and easy to maintain.
5. Peripheral equipment – electric motors require additional supporting equipment which is both heavy and voluminous. These additional electronic housings consume critical payload space on the vehicle.

A common argument for utilizing electric thrusters is that they are more environmentally friendly. It is true that petroleum based hydraulic fluids are harmful if released into the environment however all ROV, including those employing electric thrusters, contain large volumes of hydraulic fluid. Hydraulic fluid is present in auxiliary HPU as well as in pressure compensated housings. The safest approach to environmental protection is prevention. ISE employs tested design methodology and maintenance practices to ensure a leak does not happen. In extremely sensitive working environments environmentally friendly hydraulic fluids can also be utilized to ensure that if a leak does happen it does not harm marine life.