

Abstract

Amr A. Mohamed Mohamed Hassan

Design, Building and Testing Of an ROV Model

Nowadays, traditional diving is facing a lot of difficulties, especially at greater depth, so newly invented devices were introduced with sophisticated techniques are implemented to take place in such underwater deep operations. One of the most famous devices is the ROV (Remotely Operated Vehicles) which acts as a multitasking underwater device, making various underwater operations as inspection, welding, cleaning, cutting, and helps in installation for all subsea structures, pipelines, offshore platforms and commercial vessels. This paper focuses on an intense study for design, building and simulation of a simple ROV to be used for underwater inspection. The design phase included general arrangement and different equipment needed. This was carried out using computer drafting package. The design was further analyzed regarding resistance, power requirements, thruster specs, elements strength, as well as stability qualities. Based on this analysis, some parameters were modified. Flow field as well as resistance encountered by the vehicle at forward, astern, ascend and descent, and side motion were simulated using computational fluid dynamic commercial package. A small model is built from simple materials, fitted with necessary equipment and control circuits. The model is then tested in a water pool at the AASTMT campus. Some quantitative and qualitative measurements were taken. These included ascend and descend speeds, flow around the vehicle, and vehicle maneuverability as well as thrusters performance at full and part loads. Picture shots from vehicle camera were also examined.