Non-Confidential Description - PSU No. 0860
“Underwater Vehicle Aluminum Powered Combustor Drive”

**Keywords:**
Autonomous vehicle, aluminum combustor, underwater power source

**Links:**
US # 8,656,724

**Background**
Non-nuclear underwater power sources for autonomous vehicles, including internal combustion engines, battery and electric source powered motors and various types of jet propulsion are energy limited. Increasing use of underwater and surface autonomous vehicles will require high density efficient sources of propulsion and power.

**Invention Description**
This new power source uses lightweight powdered aluminum and seawater as fuel, and can provide mechanical energy through a turbine for a drive system, as well as power an alternator to provide electrical power for drive or sensor and communication equipment and devices. The combustor design utilizes steam to react with the aluminum powder for a more efficient reaction, and also produces hydrogen as a waste product, which may be utilized for other purposes. Waste aluminum oxide is separated at the discharge to prevent clogging.
Advantages/ Applications

- Energy density approximately 12x current battery power and 3-4 x greater than other proposed systems
- Uses seawater for reaction so no need to store the water component of fuel
- United States patent granted