

ENERGY-EFFICIENT HYBRID ELECTRIC VEHICLES WITH ACOUSTIC SIGNATURE SUPPRESSION/VARIATION



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

Our research has redesigned the traditional fuel-driven propulsion system to include pure electric and hybrid electric modes. The on-board electric power system is based on a novel architecture with superior coordination and enhanced stability. The acoustic noise of the vehicle is significantly reduced. The pure electric (whisper) mode offers extreme reduction and optional reshaping of acoustic signatures.

COMPETITIVE ADVANTAGE

- Priority of electric power over fuel power (the latter is engaged only when electricity is not sufficient)
- Capability to charge batteries from land-based electricity outlet (access to cheap power)
- Wide range of propulsion speeds, from very slow to very fast
- Modular design with energy efficiency and weight distribution advantages
- Electric motors and power electronic drives capable of shaping noise signatures

SUCCESSFUL APPLICATIONS OF RESEARCH

- Hybrid electric boat for water police
- Electric power system for More Electric Aircraft

PARTNERS

- Steber International
- Ampcontrol
- Institute for Aerospace Technology, University of Nottingham, UK
- Rolls-Royce@NTU Corporate Lab, Singapore

IMPACT

- Reduction of running costs and CO2 emissions
- Increased efficiency
- Improved reliability and prolonged service life
- Improved balance and stability
- Reduced acoustic noise and electromagnetic interference
- Acoustic silencing and camouflage

CAPABILITIES AND FACILITIES

- Prototype 22-foot hybrid boat (river trials in 2020)
- Laboratory model of electric power system for boat
- Laboratory model of electric power system for aircraft
- Capability to adapt to specific application requirements
- Ongoing collaboration with equipment manufacturers