

Case Study 144: Patrol Boat (Coastal Services)

SPECIFICATIONS

Waterjet:	DJ170HP x2
Engine:	CAT C18 ACERT 746kW @ 2300rpm
Gearbox:	ZF2000 (1.35:1)
Vessel:	14m L.O.A 12.56m L.W.L 19t (laden)
Performance:	46 knots



Kaohsiung Police Patrol Boat - Taiwan

DOEN DJ170HP waterjets drive this high-speed aluminium 14m monohull designed by *eRICH Naval Architect & Yacht Design* and built to CR Classification Society rule by *Shing Sheng Fa* shipyard in Taiwan. Launched in December 2015 this vessel has demonstrated excellent performance and has proven to be an extremely cost-effective vessel to build and operate.

Power is provided by twin CAT 746kW diesel engines, which are coupled to the DOEN waterjets through ZF marine transmissions. A reduction ratio is used to optimise the waterjet impeller selection. The gearbox also provides the vessel with disengagement and a back flushing capability.

The DJ170HP is a 17" (432mm) single stage compact high performance waterjet that uses Doen's latest impeller technology to delivers mixed flow type, high speed performance, within an axial build. This approach combines the key benefits of excellent high-speed efficiency with superior cavitation margins and efficiency at lower speeds and cruise conditions. This waterjet model incorporates many innovative features that enhance its application into high-speed craft. The lightweight fabricated intake tunnel for instance enabled DOEN to accommodate the requirement for tailor-made intake design to suit the hull form for this particular vessel.

Steering is by conventional helm using a power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional and easy control at all speeds, especially for pursuit and high-speed maneuvers. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ170HP waterjets are fitted with DOEN's Rotary Servo Control (RSC), which is a proportional hydraulic control system providing simple and exact follow up control of the waterjets reverse buckets, by conventional lever. This system has fully integrated hydraulics with in-built cooling; bulkhead mounted steering and reverse cylinders and all connections inboard and protected from corrosion. Conventional control levers using push pull cables operate this system. To meet the class requirement, the RSC is complemented by a back-up panel that provides another layer of redundancy for the bucket controls in this modern coastal service vessel.

The waterjets and control system are supplied to **CR Classification Society** CR100+ Patrol Boat, HSC-H.