

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Remote Control System, Water Jet**with type designation(s)
MECS Water Jet Control System

Issued to

C.W.F. Hamilton & Co. Ltd
CHRISTCHURCH, New Zealandis found to comply with
Det Norske Veritas' Rules for Classification of High Speed & Light Craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Limitations given on page 2.****Location classes:**

Temperature	B
Humidity	B
Vibration	A
EMC	B
Enclosure	B, C for bridge equipment

This Certificate is valid until **2017-07-01**.Issued at **Høvik** on **2015-12-09**DNV GL local station: **Auckland**Approval Engineer: **Poul Tranborg**for **DNV GL**

Odd Magne Nesvåg
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

Modular Electronic Control System (MECS) Water Jet Control System consisting of:

	Module:	Software version *)
	Outside bridge/operating compartment:	
JCM	Jet Control Module	5.1
ECM	Engine control Module	5.1
API	Autopilot Interface Module	5.1
DPI	Dynamic Positioning Interface Module	3.4
MkII DPI	MkII Dynamic Positioning Interface Module	1.6
PIM	Power/Interlock Module	n.a.
MkII PIM	MkII Power/Interlock Module	n.a.
	On bridge/in operating compartment:	
CPM	Control Panel Module	5.1
CPX	Control Panel Expansion	5.1
	Helm Wheel Module	n.a.
SLC	Single Lever Control (Dual Lever Control Head)	n.a.
Short SLC	Short Single Lever Control (Dual Lever Control Head)	n.a.
	Joystick Steering Module	n.a.
	Tiller Steering Module	n.a.
MJM	Manoeuvring Joystick	n.a.
HHR	Hand Held Remote Unit and Junction Box	n.a.
VDI	Voyage Data Interface	1.6
	At jet:	
JJB	Jet Junction Box	1.8
	Steering nozzle and reverse duct position sensors	n.a.
	Steering and reverse actuators, matching the size of the jets	n.a.

*) Software version: <version no.>.<revision no>, where <version no.> is updated for major changes and <revision no.> for minor changes. All revisions are backward compatible.

The software version numbers are traceable in Software Design Release Documents.

Application/limitation

At the time the present Type Approval Certificate was issued the DNV GL Rules for High Speed, Light Craft and Naval Surface Craft were still not issued. Therefore the Certificate is based on the legacy DNV Rules.

The means to emergency stop the propulsion from the navigating bridge/operating compartment are to be arranged separately to this remote control system, ref. DNV's 2013-07 Rules for High Speed, Light Craft and Naval Surface Craft Pt.4 Ch.11 Sec.3 A306 (HSC Code 11.3.1).

Separate instruments to indicate direction of thrust are required in addition to the row of LEDs provided in the CPM in order to comply with the independency requirements in DNV's 2011-01 Rules for Ships / High Speed, Light Craft and Naval Surface Craft Pt.4 Ch.14 for Ships or HS & LC.

However, if the vessel has more than two water jets installed for propulsion and directional control the need for such indicators can be considered on a case-by-case basis.

For compliance with the DNV Rule for High Speed, Light Craft and Naval Surface Craft Pt.4 Ch.13 Sec.2 E102 indicators for impeller rpm shall be arranged at each control station either separately to or via the MECS system.

A vessel classified according to DNV's Rules for High Speed, Light Craft and Naval Surface may have an additional Class Notation DYNPOS()/DPS() as specified in DNV GL Rules for Ships Pt.6 Ch.3 Sec.2. In such cases compliance with the requirements under paragraph 7.4 for additional sensors for indications for the DP operator and feedback to the DP system(s) and for indicators for the DP operator will subject to plan approval for the specific vessel design. Such compliance was not verified through this Type Approval.

Approval conditions

The Type Approval covers control system hardware and software listed under Product description except for the last two items: bucket/jet position sensors, part number 064329 and the steering and reverse actuators. These may be covered by a DNV GL Type Approval of the jet.

When the type approved software is revised (affecting all future deliveries) DNV GL is to be informed by forwarding updated software version documentation. If the changes are judged to affect functionality for which rule requirements apply a new function type test may be required and the certificate may have to be renewed to identify the new software version.

For each system intended to be installed in a DNV GL classed vessel the following documentation of the actual application is to be submitted for approval:

- Reference to this Type Approval Certificate
- System block diagram
- Power supply arrangement (may be part of the System block diagram)
- Main parts list
- Data sheets showing environmental data for steering nozzle/reverse duct position sensors and actuators
- Test program for certification

and, if updated since the Type Approval Certificate was issued:

- Software revision history document

Product certificate

Each delivery of the application system is to be certified according to Pt.4 Ch.9 Sec.1. The certification test is to be performed at the manufacturer of the application system before the system is shipped to the yard or at the yard during installation, if that is agreed by all involved parties (manufacturer, DNV GL Auckland, yard and possibly the surveyor attending at the yard). After the certification the clause for application software control will be put into force.

Clause for application software control

All software modifications made after the certification test and as long as the system is in use onboard, are to be recorded. The records, together with the software version(s) in use are to be available for evaluation at request by DNV GL. Major software changes are to be approved before being installed onboard.

Tests carried out

Applicable tests according to Standard for Certification 2.4, April 2001/4

Functional Type Test with a representative system configuration conducted at the company's UK branch in August 2004.

Job Id: **262.1-004602-6**
Certificate No: **TAA000006Z**

Type Approval documentation:

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available

Inspection of factory samples, selected at random from the production line (where practicable)

- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

Periodical assessment is to be performed at least every second year and at renewal of this certificate.

END OF CERTIFICATE