

# EC-TYPE EXAMINATION CERTIFICATE (MODULE B)

Certificate No:  
**MEDB00000BE**  
Revision No:  
**3**

Application of: Council Directive 96/98/EC of 20 December 1996 on Marine Equipment as amended by directive (EU) 2015/559, issued as "Forskrift om Skipsutstyr" by the Norwegian Maritime Directorate. This Certificate is issued by DNV GL AS under the authority of the Government of the Kingdom of Norway.

## This is to certify:

**That the Integrated navigation system (INS)**

with type designation(s)  
**Ocean Explorer INS**

Issued to

**Japan Radio Co., Ltd.**  
**Mitaka Tokyo, Japan**

is found to comply with the requirements in the following Regulations/Standards:

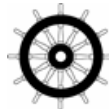
**Annex A.1, item No. A.1/4.59 and Annex B, Module B in the Directive; SOLAS 74 as amended, Regulation V/18, IMO Res. A.694(17), MSC.191(79), MSC.252(83) & MSC.302(87)**

Further details of the equipment and conditions for certification are given overleaf.

This Certificate is valid until **2021-06-08**.

Issued at **Høvik** on **2016-06-30**

DNV GL local station:  
**Yokohama**



for **DNV GL AS**

Approval Engineer:  
**Olaf Gundersrud**

Notified Body  
No.: **0575**

**Vidar Dolonen**  
**Head of Notified Body**



The mark of conformity may only be affixed to the above type approved equipment and a Manufacturer's Declaration of Conformity issued when the production-surveillance module (D, E or F) of Annex B of the MED is fully complied with and controlled by a written inspection agreement with a Notified Body. The product liability rests with the manufacturer or his representative in accordance with Council Directive 96/98/EC, as amended.

This certificate is valid for equipment, which is conform to the approved type. The manufacturer shall inform DNV GL AS of any changes to the approved equipment.

Should the specified regulations or standards be amended during the validity of this certificate, the product is to be re-approved before being placed on board a vessel to which the amended regulations or standards apply.

## Product description

The Ocean Explorer Integrated Navigation System (INS) consists of several Multifunction displays (MFDs) incorporating the below functions and integrated via a dual Ethernet platform:

| <i>Function</i> | <i>type</i>                                    |
|-----------------|--|
| • RADAR         | JMR-9200 manufactured by Japan radio Co., Ltd. |
| • ECDIS         | JAN-9201 manufactured by Japan radio Co., Ltd. |
| • CONNING       | JAN-9202 manufactured by Japan radio Co., Ltd. |
| • CAM           | JAN-9202 manufactured by Japan radio Co., Ltd. |

For details, see Appendix

## Application/Limitation

- The individual functions identified under Product description shall hold valid type approval certificates documenting compliance with applicable international standards in accordance with the Directive.
- The minimum configuration of Ocean Explorer INS for SOLAS compliance comprises 4 MFDs. The maximum configuration tested comprises 9 MFDs. An INS-topology involving additional MFDs may be approved on case-by-case basis.
- IGMP snooping and GMRP for filtering of multicast traffic shall be disabled.
- The Ocean Explorer INS shall be interconnected with dual installations of position, heading and speed sensors holding valid type approval certificates.
- The Ocean Explorer INS shall be connected to an alarm transfer system for transfer of back-up navigator alarms.
- The INS Alert Management (CAM) may handle, distribute and present bridge alerts being additional to the Ocean Explorer and its primary sensors.
- For vessels where BAM-compliance in accordance with MSC.302(83) is required the INS CAM-HMI should be arranged as the functional HMI for the BAM.
- The Ocean Explorer INS ECDIS function may be integrated with and act as HMI for the JRC JAN-9201 ECDIS TCS track control system(s).
- The Ocean Explorer INS shall be installed and commissioned onboard according to manufacturer's installation instructions.

*Note: The Ocean Explorer installation may comply with the DNVGL's additional class notations NAUT-*nn* with qualifier (ICS). The actual INS topology and the workstation arrangement are subject to approval on case-by-case basis.*

## Type Examination documentation

- See Appendix

## Tests carried out

- Performance – IEC61924-2 (2012)
- Environmental – IEC60945 (2002)
- Serial Interface – IEC61162-1 (2010)
- Serial high speed – IEC61162-2 (1998)
- Ethernet interface – IEC61162-450 (2011)
- Presentation – IEC62288 (2014)
- DNVGL Rules for Classification Ships –Pt.6 Ch.3 Sec.3 7.6

## Marking of product

The designation of Manufacturer and Type shall be fixed in a clearly visible location on the individual equipment. In addition the equipment shall be marked with serial number. Safe distance to magnetic compass and power consumption and/or supply voltage may be stated in the individual installation manuals.

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## APPENDIX

### Product Description

The Ocean Explorer INS consists of combinations of the following systems and components<sup>1)</sup>:

| Unit                       | Model Name             | Components  | Remark   |
|----------------------------|------------------------|---|--|
| ECDIS                      | JAN-9201               | Keyboard/Trackball<br>Monitor<br>Processing unit  | See ECDIS type examination certificate (TEC) for details                   |
| RADAR                      | JMR-9200               | Keyboard/Trackball<br>Monitor<br>Processing unit<br>Scanner unit<br>Transceiver unit<br>LAN nodes J4117 & J4122 | Dual radar installation<br>See RADAR TEC for details                       |
| CID / CAM                  | JAN-9202               | Keyboard/Trackball<br>Monitor<br>Processing unit  | See type approval certificates for details                                 |
| Interswitch                | NQE-3141-nA            |   | n=4,5,6,7,8  |
| Gyro compass               | TG-8000                | Dual installation   |  |
| Gyro distribution          | DGC-80                 |   |  |
| Ethernet switch            | MOXA EDS-G516E-4GSFP-T |   | The LAN components shall be duplicated                                     |
| Serial/LAN interface - ALC | JRC CMH-2370           |   |  |
| Serial/LAN interface - SLC | JRC CMH-2370           |   |  |
| Cabling                    | CAT5 STP               |   |  |
| Software version           | NDC-1590               | Multi-function ver. 02.00<br>maintenance no.02.00.xxx <sup>2)</sup>   | <sup>2)</sup> maintenance number:<br>.xxx = .022 or later<br>(x=0,1,2...9) |

<sup>1)</sup>For further details ref. installation manual 7ZPNA4466B 1.3.

### Type Examination documentation

| DNV No. | Document no. | Title  |
|---------|--------------|--|
| 51      | WM-000000450 | Test report on IEC61924-2. 8.9.5.2.2 Fault tolerance<br>Performance test report for JRC "Ocean Explorer INS" |
| 50      | WM-000000449 |  |
| 49      | WW-000001841 | Topology (min): Communication & power diagram of INS system configuration                                    |
| 48      | WW-000001840 | Topology (max): Communication & power diagram of INS system configuration                                    |
| 46      | WW-000001847 | FMEA(INS)20160317.xls  |
| 45      | WM-000000413 | INS software version list  |
| 44      | WW-000001857 | JRC_INS_Document_list  |
| 42      | WW-000001816 | INS power condition  |

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## APPENDIX

### Type Examination documentation cont.

|    |                  |   |
|----|------------------|---|
| 38 | 160129a          | IEC 61162-1 sentence-check _TestResult            |
| 37 | WW-000001838     | Alert list  |
| 35 | 160129a_20160223 | IEC 61162-1 sentence-check _TestResult            |
| 36 | WW-000001839     | ALERT ARCHITECTURE DESCRIPTION                    |
| 34 | WW-000001835     | INTEGRITY MONITORING ARCHITECTURE DESCRIPTION     |
| 33 | WW-000001836     | INS task station diagnosis description            |
| 32 | 7ZPNA4578        | INS Instruction manual: MFD (ECDIS,RADAR,CID,BAM) |
| 31 | 7ZPNA4466B       | Installation manual: MFD (ECDIS,RADAR,CID,BAM)    |
| 30 | QKW15126         | Software Quality Control Outline                  |
| 29 | EDS-G516E-4GSFP  | MOXA managed Ethernet switch                      |