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INTERNAL CONNECTIVITY

NR688 - AUGUST 2022

RULE NOTE

BUREAU VERITAS

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RULES, RULE NOTES AND GUIDANCE NOTES

The PDF electronic version of this document available at the Bureau Veritas Marine & Offshore website https://marine-offshore.bureauveritas.com/ is the official version and shall prevail if there are any inconsistencies between the PDF version and any other available version.

These rules are provided within the scope of the Bureau Veritas Marine & Offshore General Conditions, enclosed at the end of Part A of NR467, Rules for the Classification of Steel Ships. The current version of these General Conditions is available at the Bureau Veritas Marine & Offshore website.

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NR688

INTERNAL CONNECTIVITY

Section 1 Internal Connectivity

August 2022

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1 General

1.1 Application

1.1.1 The additional class notation **INTERNAL CONNECTIVITY** is assigned to units for which the on-board network infrastructure and the VSAT subscription, are sufficient to provide a reliable live connection (audio and video), between a mobile device connected to the unit Wi-Fi, and the shore.

The scope of additional class notation **INTERNAL CONNECTIVITY** is limited to the list of Internal Connectivity Areas (ICAs) specified by the applicant.

This list of Internal Connectivity Areas (ICAs), along with Class items covered, if applicable, is to be referred to in a memorandum on a Classification Certificate.

Note 1: the term units refers either to sea-going ships, naval ships, offshore units, inland navigation vessels or floating establishments for which the applicable Classification Rules of the Society apply.

1.1.2 This Rule Note gives the requirements to assess the capacity of unit internal connectivity to reliably support various applications, such as:

- remote surveys
- remote access (e.g. in the scope of the additional class notation **DYNAPOS** completed by the notation **-DDPS** as described in NR467, Rules for Steel Ships, Pt A, Ch 1, Sec 2, [6])
- remote assistance, supervision or training
- remote technical assistance and maintenance (by shipyard, manufacturer, service provider...)
- internal communication or video conference (e.g. in the scope of the additional class notation **BIORISK SECURED**, as described in NR467, Rules for Steel Ships, Pt A, Ch 1, Sec 2, [6]).

1.1.3 This Rule Note does not cover:

- cyber security and cyber safety for which reference is made to NR659 “Rules on Cyber Security for the Classification of Marine Units”
- overcrowding of wireless access point (e.g. multiple users, excessive connections...)
- network design.

Note 1: When necessary, it is the responsibility of the applicant to install additional network devices (e.g. switch...), to increase the VSAT subscription or handle network configuration, to provide satisfactory testing results.

2 Definitions

2.1 General

2.1.1 The following definitions are used in this Rule Note:

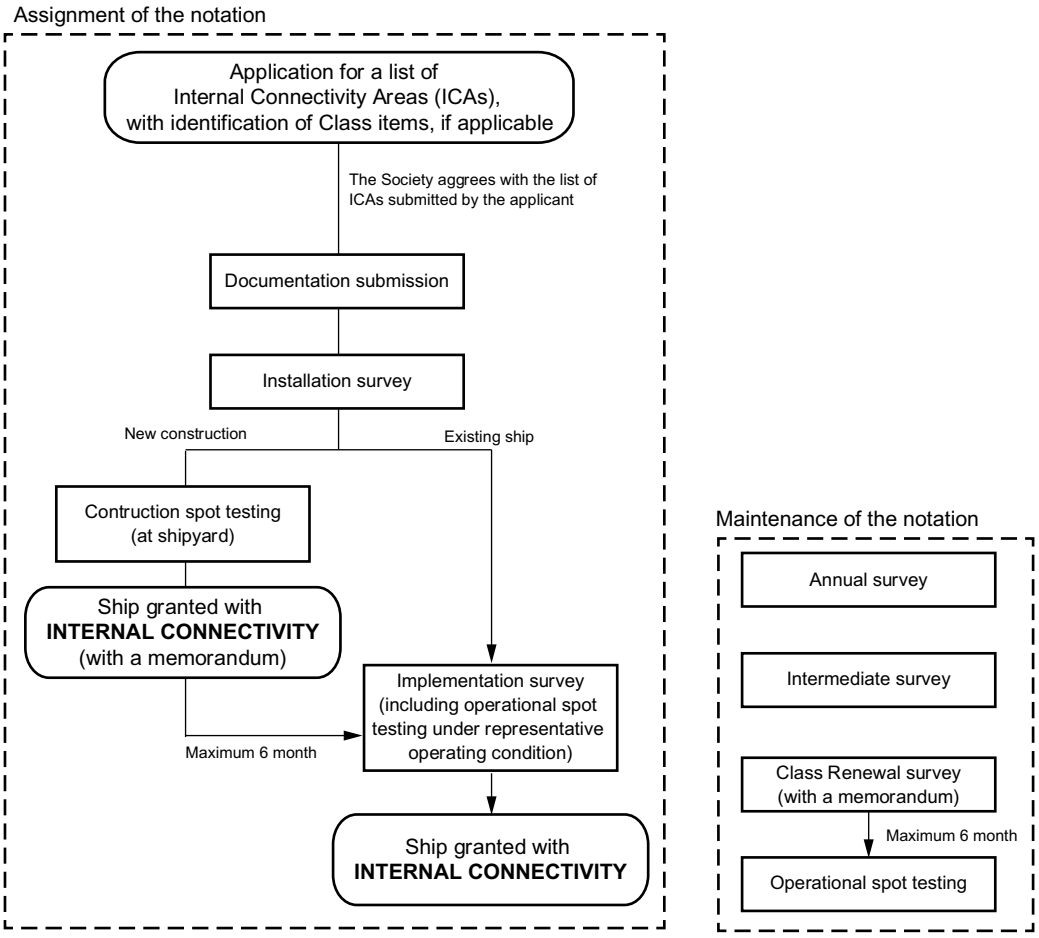
- Bandwidth: maximum capacity of communications link in Kbps (kilobits per second) to transmit data over a network connection in a given amount of time.
- Internal Connectivity Areas (ICA): applicant defined areas that delimit the scope of the notation.
- SSID (Service Set IDentifier): identifier for IEEE 802.11 standard-based wireless networks.
- VSAT (marine): satellite communication performed through Very Small Aperture Terminal (VSAT) technology.
- Wi-Fi access point: networking device that allows other Wi-Fi devices to connect to a wired network.

3 Workflow

3.1 General

3.1.1 The workflow described in Fig 1is to be followed for the assignment of the additional class notation **INTERNAL CONNECTIVITY**.

Figure 1 : Workflow



4 Documentation

4.1 General

4.1.1 The documentation to be submitted prior to the granting of the additional class notation **INTERNAL CONNECTIVITY** is listed in Tab 1.

The Society reserves the right to request the submission of additional documents if it is deemed necessary.

5 Installation and testing

5.1 General

5.1.1 VSAT subscription and unit network are to enable reliable live connection (audio & video) in ICAs, with good quality and without significant lag, between a mobile device connected to the unit Wi-Fi and the shore.

Note 1: Below are indicated for reference, an estimation of the minimum bandwidth that should be available for video streaming:

- HD Quality: 30 Kbps (Audio) / 280 Kbps (Video + Audio)
- SD Quality: 30 Kbps (Audio) / 130 Kbps (Video + Audio)
- Multi-Party: +0 Kbps (Audio) / +40 Kbps (Video + Audio) (per additional passive speaker)
- Screen sharing: +20 Kbps (Audio) / + 20 Kbps (Video + Audio) (2560 x 1600).

5.2 Installation

5.2.1 During the installation survey, the Surveyor is to verify that unit network has been installed according to the Network General Arrangement documentation (location of Wi-Fi access point, SSID...) in ICAs.

5.3 Testing

5.3.1 Qualification of network performance is performed through spot testing.

Note 1: Various causes may lead to unsatisfactory test results, for example router position, insufficient VSAT subscription, bad priority rules, low Wi-Fi signal strength, interference, bad channel configuration...

Table 1 : Documentation to be submitted

No.	Topic	I / A **(1)**	Document
CLASS NOTATION SPECIFICATIONS			
1	Internal Connectivity Areas	A	Internal Connectivity Areas defined by the applicant, with identification of Class items, if applicable **(3)**
2	VSAT Subscription	I	VSAT subscription specifications **(2)**
NETWORK SPECIFICATIONS			
3	Network General Arrangement	I	Network General Arrangement for the Internal Connectivity Areas listed in Item No 1, with: a) localization of Internal Connectivity Areas b) network devices implemented to provide connectivity (access devices) in Internal Connectivity Areas (e.g. Wi-Fi repeater), with: - power sources - list of Wi-Fi access point with corresponding SSID c) other network devices (core or distribution devices) if applicable d) structural elements which by their dimensions, materials or characteristics may affect the transmission of Wi-Fi signal (e.g. bulkhead, stairs, doors…) e) indication of other sources of perturbation, using Wi-Fi (e.g. sensors), or other radio wave protocols (e.g.bluetooth).
ON-BOARD DOCUMENTATION			
4	Documentation	I	On-board documentation presenting Wi-Fi network (e.g. Network General Arrangement summary, description of Wi-Fi access points...).
5	Personnel	I	Identification of personnel in charge of Wi-Fi and network maintenance.
6	Maintenance Procedures	I	On-board Wi-Fi and network maintenance procedures.
TESTING			
7	Testing protocols	A	Detailed testing protocols, with a minimum of: • list of the ICAs to be tested, with identification of Class items, if applicable • description of the mobile device on which the test is carried out, with hardware (e.g. camera resolution...) and software (live streaming solution) specifications • description of network configuration and unit operational conditions, as specified in [5.3.4] and [5.3.5]. **(4)**

(1) A = for approval, I = for information.
(2) VSAT subscription is mandatory for granting the notation **INTERNAL CONNECTIVITY**. In case of diminution of the VSAT subscription data, new tests are to be carried out to maintain the notation.
(3) The scope of additional class notation is limited to the list of Internal Connectivity Areas specified by the applicant.
(4) To be described both for construction spot testing and operational spot testing.

5.3.2 Testing is to be performed in ICAs after an installation survey has been completed.

5.3.3 Testing protocols, including testing area, are to be agreed between the Surveyor and the Owner prior to testing. This may be modified on site, based on the Surveyor's judgment.

5.3.4 Construction spot testing

For new constructions, construction spot testings are to be witnessed by the Surveyor in the ICAs, at shipyard. Construction spot testing aims to identify major issues which are independent of in service or on-site condition (e.g. position of Wi-Fi access points, physical barrier due to materials, signal interference...).

Note 1: For new construction, a memorandum is to be endorsed on the Classification Certificate at unit's delivery, to indicate that construction spot testings are to be completed by operational spot testing.

Note 2: As far as possible, construction spot testing are to be carried out in the expected operational conditions of the unit.

5.3.5 Operational spot testing

Operational spot testings are to be witnessed by the Surveyor in the ICAs, in the conditions of operations.

This is the responsibility of the Applicant to ensure that conditions during operational spot testing are representative of the expected in service conditions, in term of:

- network (e.g. VSAT connectivity, network traffic, priority rules and available bandwidth...)
- unit operational condition (e.g. machinery in operation...).

6 Surveys

6.1 Implementation Survey

6.1.1 During the implementation survey, the following is to be verified by the Surveyor:

- on-board documentation is available
- personnel for network maintenance is identified and familiar with the dedicated documentation and procedures
- operational spot testing as per [5.3.5].

Note 1: For new constructions, the implementation survey is to be carried not more than 6 month after the delivery of the ship.

6.2 Annual survey

6.2.1 The Owner, or his representative, is to declare to the attending Surveyor that no significant modifications have been made to the on-board network infrastructure or that VSAT subscription has not been downgraded.

6.2.2 The Annual survey is to include:

- verification of VSAT subscription contract
- verification that documentation listed in Tab 1 items 4, 5 and 6 is available on board.

6.3 Intermediate survey

6.3.1 The Intermediate survey is to include:

- all items of Annual survey given in [6.2.2]
- general visual examination of network devices, to verify their satisfactory condition
- personnel for network maintenance is identified and familiar with the dedicated documentation and procedures.

6.4 Class Renewal survey

6.4.1 The Class Renewal survey is to include:

- all items of Intermediate survey given in [6.3]
- operational spot testing, which are to be performed by the Surveyor in the conditions of operations as per [5.3.5].

Note 1: Operational spot testing are to be performed not more than 6 months after Class Renewal survey.

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