

# **Guide for Use of Remote Inspection Techniques**

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# GENERAL CONDITIONS

## Definitions:

"Administration" means the Government of the State whose flag the Ship is entitled to fly or under whose authority the Ship is authorised to operate in the specific case.

"IACS" means the International Association of Classification Societies.

"Interested Party" means the party, other than the Society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the ship builder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.

"Owner" means the registered owner, the ship owner, the manager or any other party with the responsibility, legally or contractually, to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the specific Rules.

"Rules" in these General Conditions means the documents below issued by the Society:

- (i) Rules for the Classification of Ships or other special units;
- (ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
- (iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations;
- (iv) Guides to carry out particular activities connected with Services;
- (v) Any other technical document, as for example rule variations or interpretations.

"Services" means the activities described in Article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.

"Ship" means ships, boats, craft and other special units, as for example offshore structures, floating units and underwater craft.

"Society" or "TASNEEF" means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

"Surveyor" means technical staff acting on behalf of the Society in performing the Services.

## Article 1

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:

- (i) sets forth and develops Rules;
- (ii) publishes the Register of Ships;
- (iii) issues certificates, statements and reports based on its survey activities.

1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.

1.3. The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which are regulated by these general conditions, unless expressly excluded in the particular contract.

## Article 2

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published. Therefore, the Society, although committed also through its research and development services to continuous updating of the Rules, does not guarantee the Rules meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.

2.2. The Interested Party is required to know the Rules on the basis of which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatement. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification.

The Rules for Classification of Ships are published on the Society's website: [www.tasneef.ae](http://www.tasneef.ae).

2.3. The Society exercises due care and skill:

- (i) in the selection of its Surveyors
- (ii) in the performance of its Services, taking into account the level of its technical knowledge at the time the Services are performed.

2.4. Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the Ship or of the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

## Article 3

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).

The Society is under no obligation to make statements or provide information about elements or facts which are not part of the specific scope of the Service requested by the Interested Party or on its behalf.

3.2. No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as part of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of the statements or information given by the Society. The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, is governed by the Rules of the Society, which is the sole subject entitled to make such interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.

3.3. The classification of a Ship, or the issuance of a certificate or other document connected with classification or certification and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaworthiness,

structural integrity, quality or fitness for a particular purpose or service of any Ship, structure, material, equipment or machinery inspected or tested by the Society.

**3.4.** Any document issued by the Society in relation to its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.

**3.5.** The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the ship Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, the Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.

In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.

In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third party claim, as well as from any liability in relation to the latter concerning the Services rendered.

Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties with respect to the services rendered by the Society are described in the Rules applicable to the specific Service rendered.

#### **Article 4**

**4.1.** Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

**4.2.** In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested. In the event of late payment, interest at the legal current rate increased by 1.5% may be demanded.

**4.3.** The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

For every termination of the contract, the fees for the activities performed until the time of the termination shall be owed to the Society as well as the expenses incurred in view of activities already programmed; this is without prejudice to the right to compensation due to the Society as a consequence of the termination.

With particular reference to Ship classification and certification, unless decided otherwise by the Society, termination of the contract implies that the assignment of class to a Ship is withheld or, if already assigned, that it is suspended or withdrawn; any statutory certificates issued by the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

#### **Article 5**

**5.1.** In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see art. 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

Therefore, except as provided for in paragraph 5.2 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

**5.2.** Notwithstanding the provisions in paragraph 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only). Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.

**5.3.** Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

#### **Article 6**

**6.1.** These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

**6.2.** However,

- (i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and
- (ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

#### **Article 7**

- 7.1.** All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorisation of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.  
Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.
- 7.2.** Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, the Society's clients hereby accept that the Society may participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.
- 7.3.** In the event of transfer of class, addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for the purpose of classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.  
In the event that the ownership of the ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

#### **Article 8**

- 8.1.** Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.

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## **1 GENERAL**

### **1.1 Scope**

The aim of this Guide is to provide indications for the use of the Remote Inspection Techniques (RIT) in conjunction with the class surveys. In this Guide reference is made to IACS Rec. No. 42 "Guidelines for Use of Remote Inspection Techniques for surveys", the complete text of which has been included for ready reference in Appendix 1.

Provisions of equivalent recognized standards may be accepted at Tasneef's discretion.

Whenever drones, umbilical systems, unmanned robot arms, climbers and/or any other system, deemed acceptable by the Society, is (are) used in conjunction and/or as ancillary assistance to the class related activities this (these) is (are) considered as a Remote Inspection Technique assisting the attending surveyor in performing its activities.

### **1.2 Field of application**

This Guide applies to any kind of marine or offshore class inspection expecting the use of RIT in conjunction to the direct attendance of the surveyor in the areas subject of the inspection itself.

An exception is the in-water survey of the unit's bottom parts for class purposes, which is already regulated by specific provisions contained in the applicable Tasneef Rules for Classification.

### **1.3 Definitions**

#### **1.3.1 Area of Inspection**

Part of the equipment and/or structure subject to inspection.

#### **1.3.2 Close Up Survey**

A survey where the details of structural components are within the close visual inspection range of the Surveyor, i.e. normally within reach of hand, which is defined in the applicable Tasneef Rules for Classification. A close up survey may be referred by the offshore industry as close visual inspection.

#### **1.3.3 Close Visual Inspection (CVI)**

Terminology used by the offshore industry to indicate the examination carried out at a sufficient proximity of the area of inspection, i.e. the extent, scope, or distance in which a surveyor can personally operate or in which its direct sensory visual experience is effective.

#### **1.3.4 Hazardous areas**

Areas where flammable or explosive gases, flammable or explosive dust are normally present or may be present.

#### **1.3.5 Hazardous areas plan**

A plan of the spaces or zones subject to inspection where all hazardous areas, as defined above, are clearly located.

#### **1.3.6 National Laws**

Any law, decree or equivalent document issued by the Administration of the State under which the unit is flying its flag and by the Administration of State where the unit is operating.

#### **1.3.7 Operator**

The person properly skilled and provided with the necessary competence to operate the remote inspection devices or to perform the remote inspection. The operator shall be provided with any certification/license for the use of remote technique inspection systems/devices, which might be expected by the international/national laws in force.

#### **1.3.8 Overall Survey**

A survey intended to report on the overall condition of the hull structure and determine the extent of additional close-up surveys.

#### **1.3.9 Overall Visual Inspection (OVI)**

Terminology used by the offshore industry to indicate the general visual inspection of the space/zone/item.

#### **1.3.10 Owner**

The registered Owner, the ship Owner, the manager or any other party with the legal or contractual responsibility to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the specific Rules.

#### **1.3.11 Remote Inspection Technique (RIT)**

A methodology of survey which allows the inspection of areas by means of devices and/or skilled personnel by making available all or at least equivalent information normally obtainable by the in-place intervention of the surveyor. It may be carried out by the use of remote inspection facilities such as:

- Divers
- Unmanned robot arm
- Remote Operated Vehicles (ROV)

- Climbers
- Drones
- Umbilical fiber cameras
- Other means acceptable to the Society

#### 1.3.12 Service Provider

A person or society that is an External Specialist, not employed by an IACS Member, recognized by Tasneef in the use of the remote inspection techniques. The Service Provider should be qualified according an International Standard such as ISO 9001/2015 or equivalent. As an alternative, it should have an internal Quality Management System, which should:

- Enhance customer satisfaction through the effective applications of the system, including processes for continual improvement of the system and conformity to customer and applicable statutory and regulatory requirements;
- Demonstrate its ability to provide consistently services that meet customer and applicable statutory and regulatory requirements.

The service provider can be also the manufacturer of the Remote Inspection equipment.

The Service Provider is responsible for the qualification and training of its personnel (among them, its operators) to a recognized national or international regulations and/or industry standard as applicable.

#### 1.3.13 Survey Planning

The document jointly prepared by the Owner and the Service Provider in which all survey details, including safety aspects, are duly taken in consideration.

## 2 REMOTE INSPECTION FACILITIES AND TECHNIQUES

### 2.1 General

Remote inspection facilities are those equipment and/or systems intended to inspect areas and collect information that may constitute the useful support for the Surveyor avoiding, at the same time, his/her presence in the said area.

### 2.2 Remote Inspection Facilities typologies

Two categories of remote inspection facilities are considered:

- Those for which it is required that the operator carries the equipment which allows a Surveyor located not in close visual inspection range to inspect the area of interest. Typically in this category can be included divers and climbers;

- Those for which the operator may operate the equipment from a remote position in respect to the area inspected. In this category can be included drones, remotely operated vehicles (ROV), umbilical fiber systems (e.g boroscopes, fiber cameras, etc.), autonomous and semi-autonomous robotic systems.

### 2.3 Application of the RIT

Remote inspection techniques are mainly intended as a working instrument the use of which may be considered to reduce the operational intrusiveness related to the request of physical presence of the attending Surveyor in the area to be inspected.

Examples of possible applications of RIT aimed at reducing the operational intrusiveness can be the following:

- Inspection of narrow spaces or parts of a system of difficult access (e.g. internal of piping, internal of pressure vessels, etc.) avoiding any unnecessary dismantling.
- Preliminary condition assessment of large spaces or structures, in order to easily collect preliminary data at specified locations.
- Reducing or removing the need for personnel working at heights through conventional means of access (e.g., staging, scaffolding, rafting, etc.).
- Monitoring the condition of temporary repairs located in areas not easily reachable or that might require a long preparation to be accessed.

Notwithstanding the above, the attending Surveyor may be allowed to use remote inspection techniques also to survey areas, equipment or systems that are not characterized by problems related to operational intrusiveness.

### 2.4 Use of RIT for Class Surveys

When carrying out any class surveys, the RIT shall be regarded as an auxiliary tool to assist the attending Surveyor.

The acceptance of the outcomes of an inspection performed by means of RIT is under the discretion of the attending surveyor. Independently by the outcomes of the RIT, it is prerogative of the surveyor to require additional inspection(s) by establishing its (their) extension and methodology.

Should the Surveyor have any doubt or be not satisfied with the results provided by the RIT, additional inspection using other alternative or traditional inspection methods may be required.

### 2.5 Remote Inspection Facilities requirements

The Service Provider should select the most suitable RIT equipment in relation to the typology of the area/system to be inspected and the inspection to be



carried out, since the characteristics and capabilities of each one may differ. The following considerations may be used as guideline in order to select the most suitable RIT equipment:

### 2.5.1 Safety

RIT equipment and ancillary components should be rated for the intended environment where it will be operated.

Construction materials and design of the RIT equipment and ancillary components should be compatible with (and not hazardous for) the environment where the inspection area is located.

Particular attention should be paid to the possible malfunctioning of the equipment and the possible consequences.

Any critical part of the RIT equipment and ancillary components should be designed by applying the redundancy concept in order to minimize the risk associated to possible failures. Backup operation modes to be activated in case of malfunction or failure (e.g. manual piloting vs. autonomous or semi-autonomous operation) should also be considered.

For those RIT equipment and ancillary components carried by the operator, the additional safety aspects connected with possible shock hazards, injuries caused by sharpened parts, and in general with the health of the operator should be duly taken in consideration.

### 2.5.2 Accessibility

RIT equipment and ancillary components should be designed for the intended environment where it will be operated by taking in account its characteristics (e.g. presence of possible strong winds, rain, humidity, warm or extremely cold surfaces, etc..)

The size of the RIT equipment and ancillary components should be considered in order to allow safe and effective passage and manoeuvring in the area to be inspected, especially for those that are carried by the operator in the area to be inspected (climbers, etc..)

### 2.5.3 Operability

For those RIT equipment and ancillary components that may be remotely operated, the relevant control station should provide adequate means and user interface for easy, reliable and accurate operation.

The device positioning control system should allow a stable and accurate maintenance of any assigned position. A localization system should be provided for those RIT equipment which may be operated also outside the visual range of the operator. Their work autonomy should be sufficient in order to grant the execution of the planned inspection (or planned fraction of inspection).

For those RIT equipment and ancillary components carried by the operator, it should be considered their weight in order to avoid any tiredness.

Adequate means and user interface for easy, reliable and accurate operation, e.g. by simple actions or movements of the operator itself, should be considered.

### 2.5.4 Data Acquisition

The equipment should be provided with suitable systems to allow the acquisition of a suitable coverage and level of detail of the area inspected, adequate for the inspection being carried out.

All data should be of adequate quality and should be recorded and stored in a suitable manner so that data security (i.e. confidentiality, integrity and availability of data) is ensured to an acceptable level.

Videos, images and photos should have a minimum resolution of 600 pixels per inch. Audio recording should be of adequate quality and have a sample rate and bit depth sufficient to allow voice and sound identification. Measures for the maximization of signal/noise ratio should also be considered.

### 2.5.5 Communication Systems and recording

The equipment should be designed to provide and maintain an adequate and safe communication with the operator when remotely operated.

The data transmission channel from the equipment and its ancillary components, when provided, should be stable and safe in order to ensure an adequate level of confidentiality, integrity and availability of the data transmitted.

The data recording methods, media and procedures should ensure at least the same level of data security obtained during data acquisition and transmission, in order not to lower the level of data quality and information content.

### 2.5.6 Data storage and review

The RIT equipment should be provided with an efficient data storage system.

The data storage methods, media and procedures should ensure at least the same level of data security obtained during data acquisition, transmission and recording, in order not to lower the level of data quality and information content.

In case the data recorded by the equipment are not in a format readable by the software tools commonly available, or is not compliant to any industry standard, means are to be provided to export the data in a format that can be displayed by the software tools commonly available on a PC (such as video players, image file viewers, audio players, etc..).

The data storage systems should be designed and operated to allow controlled, timely and secure access to the data for review.

### 3 INSPECTION PROCESS

#### 3.1 General

The inspection process, as further developed hereafter, should be conceived so as to grant the principle that the information acquired, processed and recorded through the use of the Remote Inspection Techniques are at least equivalent to those that an appointed Surveyor may obtain by inspecting the area, equipment or system, through his/her direct attendance, being supported by any type of inspection methodology that may be applicable (e.g. ultrasonic thickness measurements, Non Destructive Examination, clearance measurements, functional parameters measurements, etc.).

#### 3.2 Conditions for the Inspection

The remote inspection of a specific area, equipment or system can be planned in any case that the in-place intervention of the surveyor might be not feasible or not advisable for safety reasons. This should not limit the use of RIT, which may be used in any kind of inspection when deemed feasible and acceptable by the Rules.

The Remote Inspection Techniques might be not the appropriate methodology of inspection when any of the following conditions already exists or are observed during the inspection itself:

- a) The condition of the environment where the area, equipment or system to be inspected does not allow its exhaustive examination;
- b) There are existing records indicating that the area, equipment or system to be inspected are affected by deficiencies;
- c) The inspection reveals that the area, equipment or system is requiring immediate attention.

Other cases not listed above may limit or make useless the adoption of RIT as alternative means of inspection.

In case any of the above conditions exist or the attending Surveyor finds any other hindrances, the RIT should be replaced by a survey carried out according to the conventional techniques or by more suitable methods of RIT inspection.

In some cases, notwithstanding the inspections are conducted by means of RIT, the Surveyor may require a direct access to the area, equipment or system for the assessment and the determination of the maintenance conditions and or possible repairs.

#### 3.3 Inspection Planning

Proper planning between the asset Owner/Operator representatives, RIT Service Provider and attending Surveyor prior to the inspection, is an essential part of the process to facilitate a safe, effective, and efficient conduct of the inspection itself.

Prior to the commencement of any operation, an inspection plan should be jointly prepared by the asset Owner/Operator and the RIT Service provider. The plan should contain:

1. Details and particulars of the ship or unit;
2. Description of the area, equipment or system to be inspected, including any document (plans, drawing, etc.) that might contain useful information;
3. Type of inspection (e.g. occasional, periodical, not required by the rules...) and extent of the inspection (detailed, overall...);
4. Possible presence of areas, part of equipment, or system, that need to be subjected to a Close Visual Inspection;
5. Inspection requirements according to the Rule or standard adopted. The inspection requirements should take in account the type of unit to be inspected, the type of inspection and its extent;
6. Details of the inspection: location (shipyard, berth, anchorage), date, required time, work permit(s), operational procedures, etc.;
7. Condition of inspection according to the anticipated condition of the area, equipment or system to be examined;
8. Description of the RIT method to be used;
9. Assessment of the risks connected to the activity and with regard to the RIT chosen. Among other subsidiary risks the following should be taken in account:
  - Explosion risks in hazardous areas (possible presence of flammable or explosive media) where the RIT has to be operated or where the RIT should transit;
  - Explosion risks for hazardous equipment carried by the RIT devices (e.g. batteries, electric driving motors, cameras, etc.);
  - Possible works or operations connected to the activity of the unit that may interfere with the activity of the remote inspection device (or vice-versa), including radio-frequency interference that may impair the reliability of remote control systems and/or autonomous positioning and localization systems, or other subsystems onboard the device or in the remote control station, as applicable;

- Dropping of objects and equipment carried out by the remote inspection device (e.g. drones or climbing robots);
  - Loss of control of remotely controlled devices operating beyond line of sight, and their possible rescue and recovery;
  - Environmental conditions that can affect the quality of data acquisition or of the operation in general (e.g. lighting, cleanliness, humidity, etc.);
  - Collision of the remote inspection facility with obstacles or structures of the unit;
  - Method of access to the area, equipment or system to be inspected;
  - Cyber security issues.
10. Description of the type of data to be acquired, their presentation and reporting. This should include also the details on the data storage and retrieval;
  11. List of qualified operators who will operate the remote inspection devices, the data recording systems, etc.;
  12. Description of the system of communication between the operator(s) of the remote inspection device and the attending surveyor;
  13. Procedures to be followed in case the remote inspection device should be operated in emergency;
  14. Description of the precautions to put in place in case of an emergency situation of the unit;
  15. Description of the environment conditions within the remote inspection device may be operated safely;
  16. Description of the safety measures to be taken in order to grant the safety of all the persons involved in the inspection.

The survey planning, duly signed by the Owners/Operators of the unit and by the RIT Service Provider, should be submitted in advance to the attending Surveyor for review and agreement.

### 3.4 Inspection Meeting

Under the responsibility of the RIT Service Provider and under the permission of the Owner's representative, the operator(s) performs the remote inspection according to the instructions given by the attending Surveyor by taking in account all the operational limitations as agreed in the survey plan.

The attending surveyor may stop the execution of the survey at any time whenever he/she deems that the inspection is not carried out according to the provisions of the planning or the instructions provided to the operator.

In case of unexpected behavior of the remote inspection equipment or when the environment conditions change by making dangerous the continuation of the inspection, the operator has to suspend any operation and retrieve the equipment.

### 3.5 Data Review

At the end of the inspection, the attending surveyor may review the acquired data for the extension deemed necessary. In this context the Owners/RIT Service Provider arrange a proper place and equipment which enable the data review by part of the Surveyor.

According to the result of the data review, the attending Surveyor may decide for additional verifications:

- by using the same RIT, or
- by requiring additional alternative remote inspection techniques, or
- by carrying out the additional inspection according to the traditional inspection methods.

### 3.6 Data Reporting

The RIT service provider should prepare and provide the report by identifying all the details of the inspection executed. The report should include all data acquired in a readable version.

The report should include:

- General data of the unit (e.g. Name, Port of registry, Flag, International Call sign, IMO no. as feasible);
- Inspection information including (as feasible) type of inspection, location of inspection, area/equipment/system inspected;
- Details of the inspection and its outcomes;
- Details of the RIT service provider, details of RIT used for the inspection, details of the equipment and ancillary components.

## **Appendix 1: Guidelines for Use of Remote Inspection Techniques for Surveys**

In this Appendix the complete text of the IACS Rec. No. 42 "Guidelines for Use of Remote Inspection Techniques for Surveys", Rev. 2 (June 2016) is reproduced for ready reference. It is recommended to refer to the original document for modifications and amendments occurred after the publication of this document.

### **A.1 General**

#### **A.1.1 Definitions**

Remote inspection techniques may include the use of:

- Divers
- Unmanned robot arm
- Remote Operated Vehicles (ROV)
- Climbers
- Drones
- Other means acceptable to the Society.

**A.1.2** When permitted remote inspection technique may be used to facilitate the required external and internal examinations, including close-up surveys and gauging.

The methods applied for remote inspection technique are to provide the survey results normally obtained for/by the Surveyor.

The results of the surveys by remote inspection techniques when being used towards the crediting of surveys are to be acceptable to the attending Surveyor. Inspections should be carried out in the presence of the Surveyor.

**A.1.3** Confirmatory surveys/close-up surveys may be carried out by the Surveyor at selected locations to verify the results of the remote inspection technique.

Confirmatory thickness measurements may be requested by the attending Surveyor appropriately.

An inspection plan for the use of remote inspection technique(s), including any confirmatory survey/close-up survey/thickness measurements, is to be submitted for review and acceptance in advance of the survey.

### **A.2. Conditions**

**A.2.1** Use of remote inspection technique may be restricted or limited where there is a record or indication of abnormal deterioration or damage to structure or to items to be inspected.

The remote inspection technique may not be applicable if there are recommendations for repairs.

It may also be inapplicable if conditions, affecting the class of the vessel, are found during the course of the inspection.

If the remote inspection technique reveals damage or deterioration that requires attention, the Surveyor may require close-up survey/thickness measurements without the use of remote inspection technique to be undertaken.

### **A.3. Procedures**

**A.3.1** The inspection is to be carried out by a qualified technician with adequate knowledge of the items to be inspected.

Prior to the commencement of surveys, a pre-meeting should be held between the technician(s), the owner's representative(s) and the attending Surveyor(s) for the purpose to ascertain that all the arrangements detailed in the inspection plan are in place, so as to ensure the safe and efficient conduct of the inspection work to be carried out.

**A.3.2** Means of thickness gauging and non-destructive testing may be required in conjunction with the use of remote inspection technique.

**A.3.3** Items to be examined using remote inspection technique are to be sufficiently clean to permit meaningful examination.

**A.3.4** Visibility is to be sufficient to allow for a meaningful examination.