Proposal on the Amendments of ESP CODE to ensure Safety of RIT

team “Grand Bleu”

01
Background

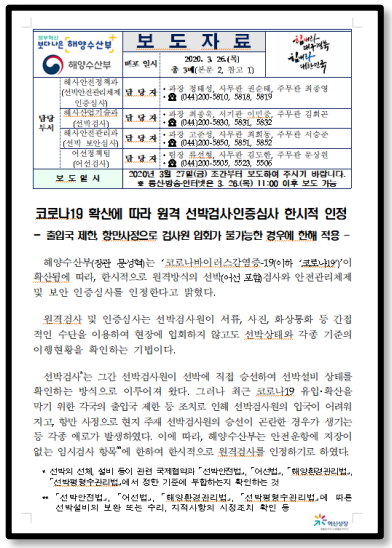
02
Research
Subject

03
Problem

04
Proposal
& Conclusion

1. Background
COVID19 and Inspection

MOF (KR)



보 도 자 료

2020. 3. 26.(목)

코로나19 확산에 따라 원격 선박검사인증심사 한시적 인정

– 중입국 제한 항만사정으로 검사원 입회가 불가능한 경우에 한해 적용 –

IMO

INTERTANKO

Covid-19 Tanker Recovery Management Plan

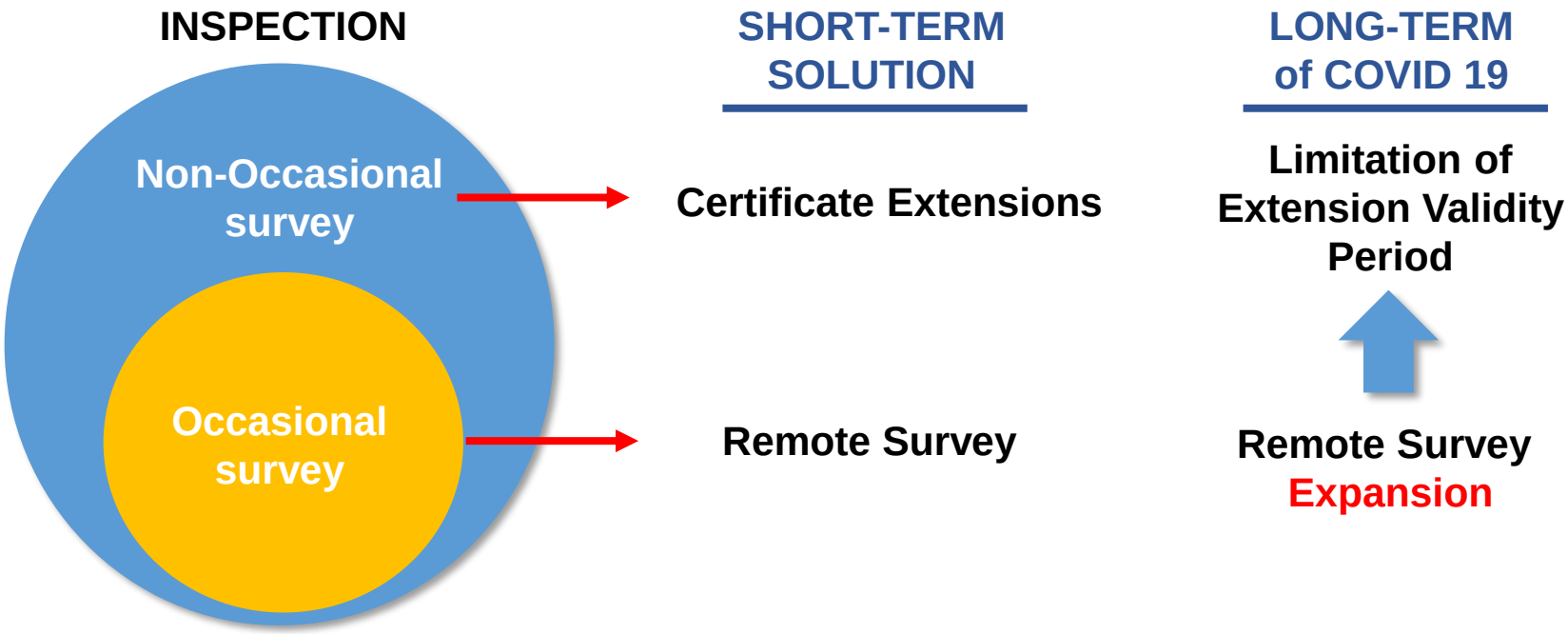
Remote surveys are introduced for occasional survey

Remote survey : a survey that is undertaken without the Surveyor being directly in attendance
e.g. not being onboard an asset or visiting an office or manufacturing site.

-Pert 1 shipment's group infection (Busan, Korea) – news 1 / -Diamond Princess shipment's infection (Japan) – KBS news
-Reported Material by Ministries of Oceans and Fisheries / Circular Letter No.4231/Add.10 21 August 2020

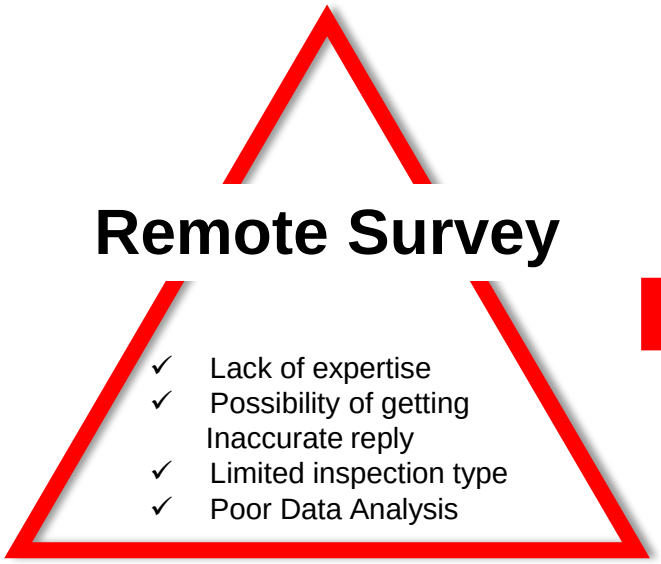
1. Background

COVID19 and Inspection



1. Background

COVID19 and Inspection



Have a significant impact on
PSC data collection, P&I, and marine safety analysis.

Thus,

relatively safe RIT

should be introduced.

To resolve these limitations of remote surveys

and the issue of extending ship certificates

- ✓ **Definition and guideline for Service Supplier to MSC, SDC/III (OW2)**
- ✓ **Definition of RIT Radiocommunication to MSC, HTW/SSE (2.10)**
- ✓ **Obligation for prior notice for securing radio communication safety to MSC, SDC/III (OW2)**

01
Background

02
Research
Subject

03
Problem

04
Proposal
& Conclusion

2. Research Subject

Definition of RIT

1.2 xx Remote inspection techniques (RIT)

Remote inspection technique is a means of survey
that enables examination of any part of the structure
without the need for direct physical access of the surveyor.

- 2011 ESP CODE, MSC.461(101)

UAV(Drone)

Robot arm

ROV

… Climber, Divers, Other means acceptable to the Society etc…
(IACS Rec 42 Rev.2)

2. Research Subject

Why RIT? - ① IMO 2018-2023 Strategic Direction

INTERNATIONAL MARITIME ORGANIZATION

<SD2>

Integrate new and advancing technologies in the regulatory framework

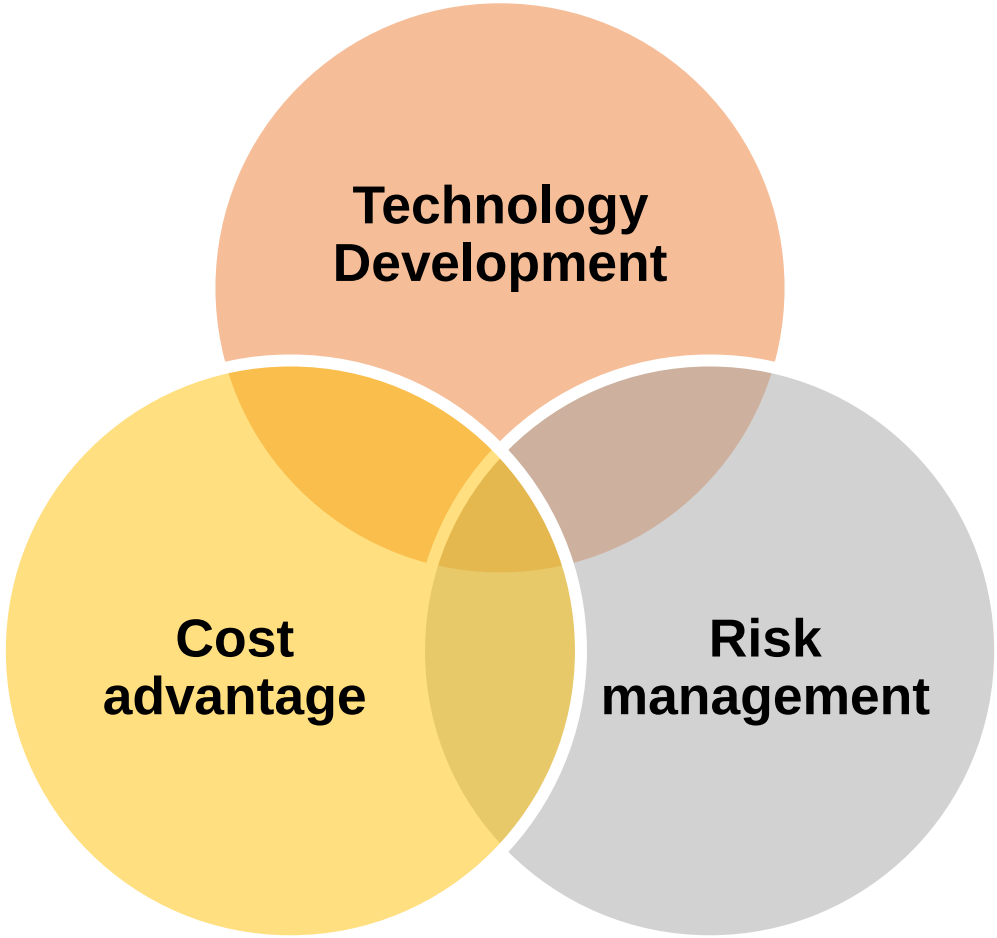
17 New and advancing technologies have brought about changes at all levels in the way ships are designed, constructed, equipped and operated,…,such technologies may also provide access to a large amount of data associated with shipping.

18 Since technological advances introduction needs to be considered carefully in order for them to be accommodated appropriately into the regulatory framework of the Organization, involving balancing the benefits derived from new and advancing technologies against safety and security concerns…

19 The Organization's regulatory framework will be continually adapted to the challenges and global developments facing the shipping industry, with a view to ensuring safety, security and environmental protection.

2. Research Subject

Why RIT? - ② Advantages of RIT



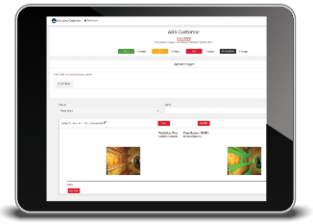
2. Research Subject

Why RIT? - ② Advantages of RIT : technology development

- Use RIT **difficult or dangerous** part to access **by surveyor.**
  - Ballast and cargo tanks
  - Cargo holds
  - Jack-up legs
  - Structural components of maritime and offshore installations
  - Load line exchange
  - Boiler extension inspection

- **Accurate and objective** data analysis by **machine learning**
  - ABS Corrosion Detection product
  -a digital tool powered by machine learning for early-stage analysis of visual data

- Advantages
  - **Identifies and quantifies structural deterioration** due to corrosion and poor coating
  - **Provides reliable and consistent evaluation** using machine learning algorithms based on asset-specific structural data
  - **Enables shared understanding** of an asset's condition status



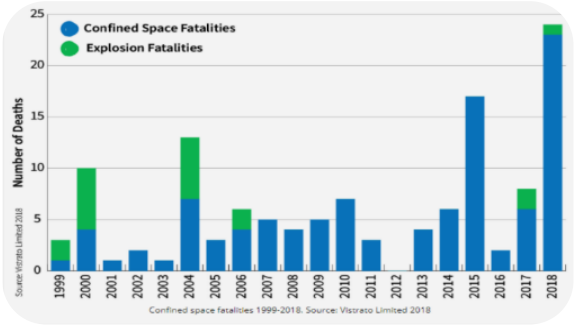
https://ww2.eagle.org/en/Products-and-Services/digital-solutions/Corrosion-Detection.html

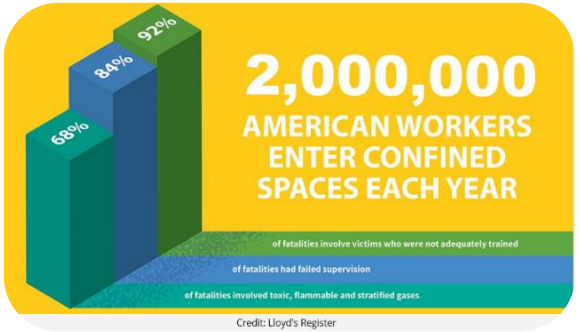
2. Research Subject

Why RIT? - ② Advantages of RIT : risk management

➢ **Solving Enclosed Space Hazard problem**

- Serious risk of fire or explosion
- Loss of consciousness from asphyxiation arising from gas, fumes, vapour or lack of oxygen
- Loss of consciousness arising from an increase in body temperature
- Fatalities
  - : Drowning arising from increased water level
  - : Suffocation arising from free flowing solid (engulfment) or the inability to reach a breathable atmosphere due to entrapment.





IACS (Rev.2 2007); CONFINED SPACE SAFE PRACTICE
Survey by remote inspection techniques - use of approved service suppliers-DNV GL
Research conducted by Lloyd's register (organized by safety4sea)

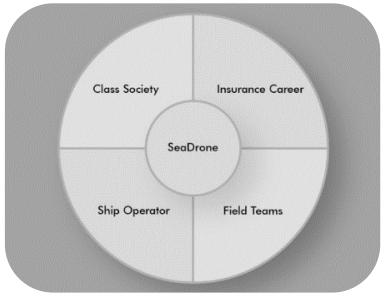
2. Research Subject

Why RIT? - ② Advantages of RIT : cost advantage

➢ **Offers the promise of lower cost inspections**

1. Go-Paperless

- Live-streaming of surveys from distant locations lowers costs, safety risks
- Connects the gap of communication between class societies, insurance carriers, ship operators and field teams and creates platform where these stakeholders can trust each other



2. No costly procedures required

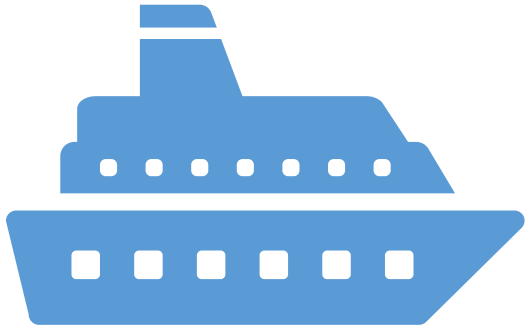
- Avoid the use of costly rafting, cherry pickers or staging, while still obtaining the information required

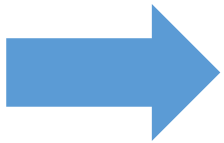
3. No travel cost

- Surveyor travel costs and accommodation for surveys will be highly reduced.

2. Research Subject

Why RIT? - ③ Digitization of Maritime industry

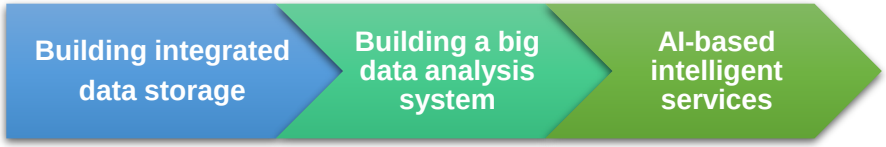




Maritime Industry Digitization

MASS

Building big data during ship operations



INSPECTION

→ Digitization of Inspection using big data

2. Research Subject
OUR WORK

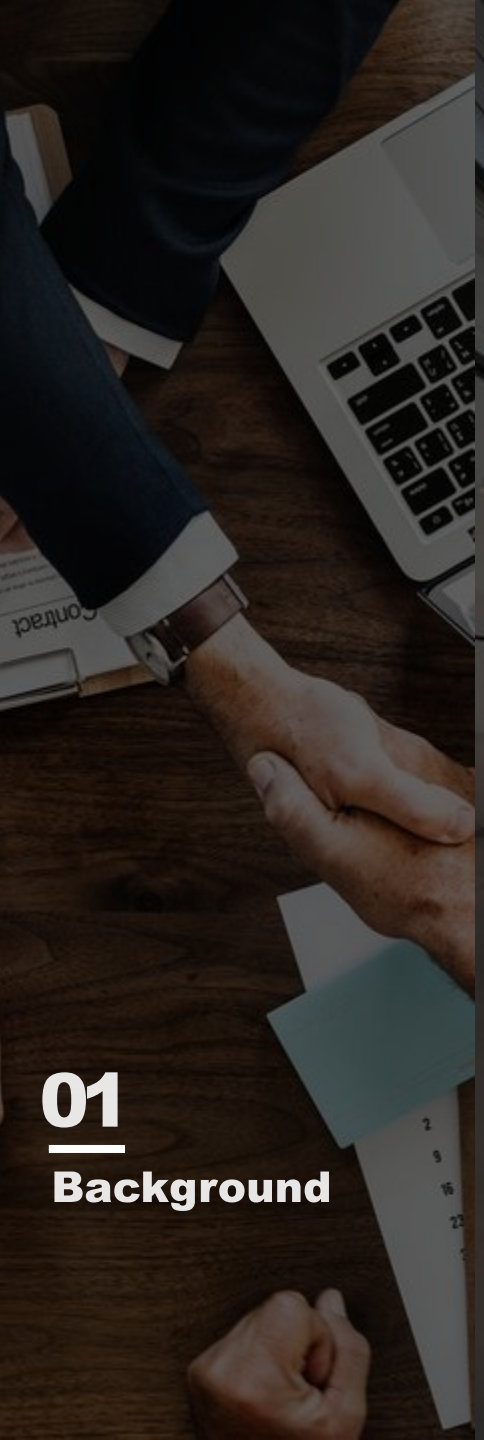
Following IMO 2018-2023 Strategic Direction,

RIT's increasing demand with advantages mentioned earlier,

Digitization of maritime industry

**Discussions should be begun from this pandemic situation,
where the need has been highlighted.**

**Only then the safety can be guaranteed by globally recognized standard
which is achieved along with high advance in technology**



01
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02
Research
Subject

03
Problem

04
Proposal
& Conclusion

3. Problem

What's key point?

Inspection		RIT
Class Surveyor	**Operator**	**Service Supplier**
Direct Inspection	**Format**	Indirect Inspection **(iOT based on radiocommunication)**
communication gear, ultrasonic equipment, photographic gear	**Equipment**	UAV, ROV, Robot arm
structural condition, radio communication, emergency system	**Scope**	Ballast and cargo tanks Cargo holds Jack-up legs

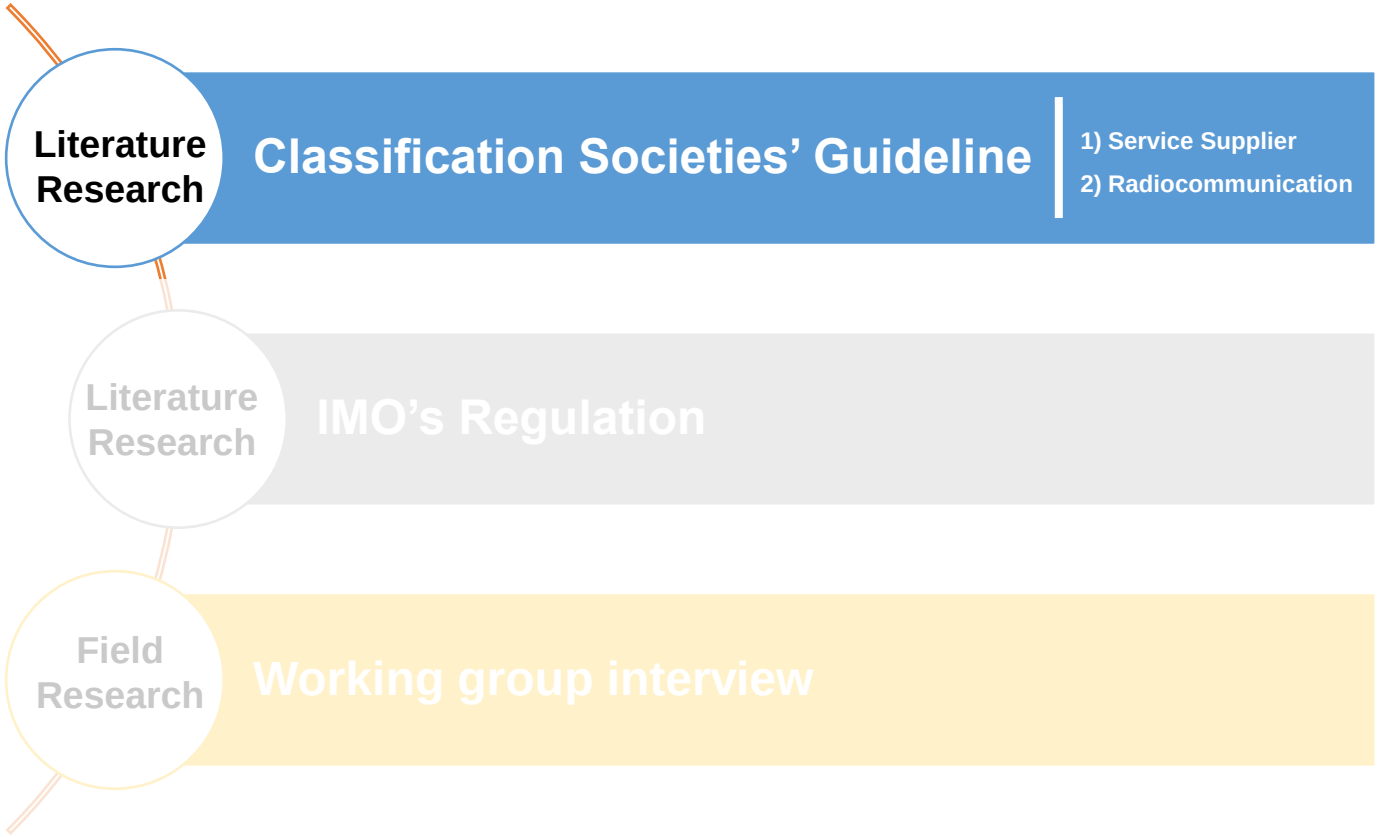
Service Supplier and **Radiocommunication** parts are needed to be considered most importantly

3. Problem

Research method

3. Problem

Research method



3. Problem

① Classification Societies' Guideline – Service Supplier

RO	Acceptance Criteria	Role in Planning
KR	Applies 'IACS UR Z17'	Determines the equipment type , perform risk assessment, develop the plan and flight approval
ABS	Applies 'IACS UR Z17' and obtain ISO 9001 certification or equivalent third-party vetting credentials is recommended.	Determines the equipment type, perform a risk assessment and develop the plan
LR	Supervisor two (2) years' experience in the inspection. Operator at least one (1) year's experience as an assistant carrying out inspections	Carries out procedures with Guideline on planning, carrying out and reporting inspections
DNV GL	Applies 'IACS UR Z17'	No Guideline Specified (X)
NK	X	Determines the equipment type, procedure for inspecting the survey area. Confirms the communication environment in advance

New integrated convention for **"Service Supplier"**

3. Problem

① Classification Societies' Guideline - Radiocommunication

RO	RIV Types	Reference about Radiocommunication Safety
KR	**UAV / ROV** / Unmanned Robot Arm	X
ABS	**UAV / ROV** / Robotic Crawler	X
LR	**UAV / ROV** / Unmanned robot arm. / Climbers. -Others(tethered/ Untethered)	X
DNV GL	**UAV / ROV**/ Climbers	X
NK	**-UAV** **-ROV**	1.Remote surveyor confirms the communication environment to ensure the sufficient quality 2. Check the communication status with the ship on the day of survey

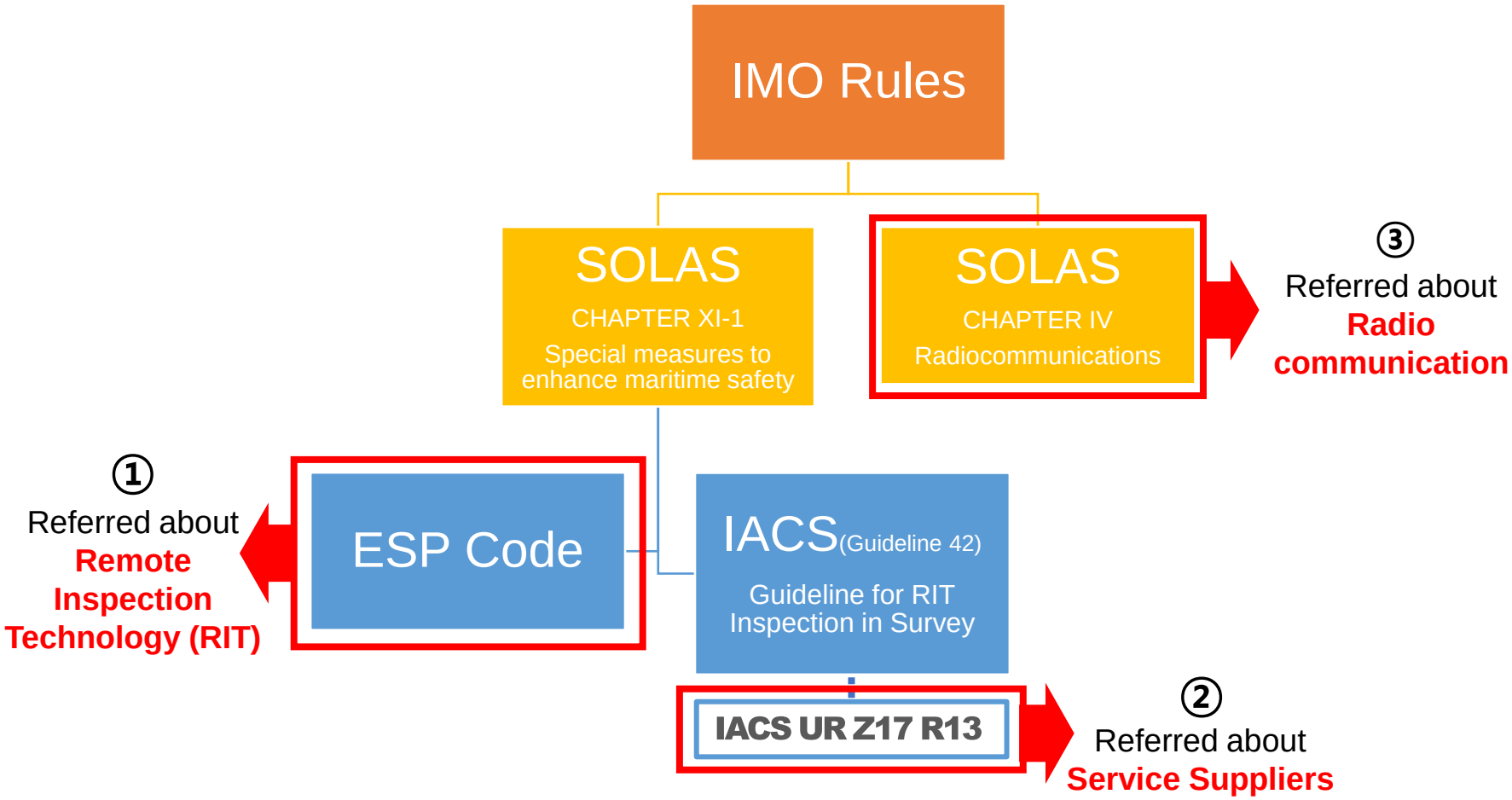
The core equipments of RIT are **UAV and ROV**,
and there is **NO reference about radiocommunication safety**

3. Problem

Research method

3. Problem

② IMO's Regulation



3. Problem

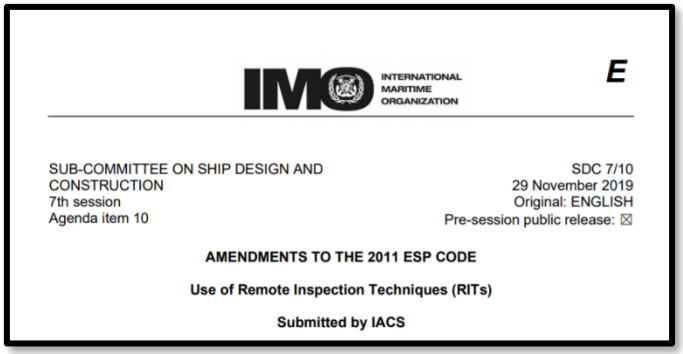
② IMO's Regulation – RIT in ESP code

INTERNATIONAL MARITIME ORGANIZATION

"ESP Code"

INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS

- ✓ **Amended by Resolution MSC.461(101)**
- ✓ **Amended RIT's Definition, Procedures and Requirements**
- ✓ **Absence of the concept of Service Supplier and RIT Radiocommunication in ESP CODE**



IMO INTERNATIONAL MARITIME ORGANIZATION

E

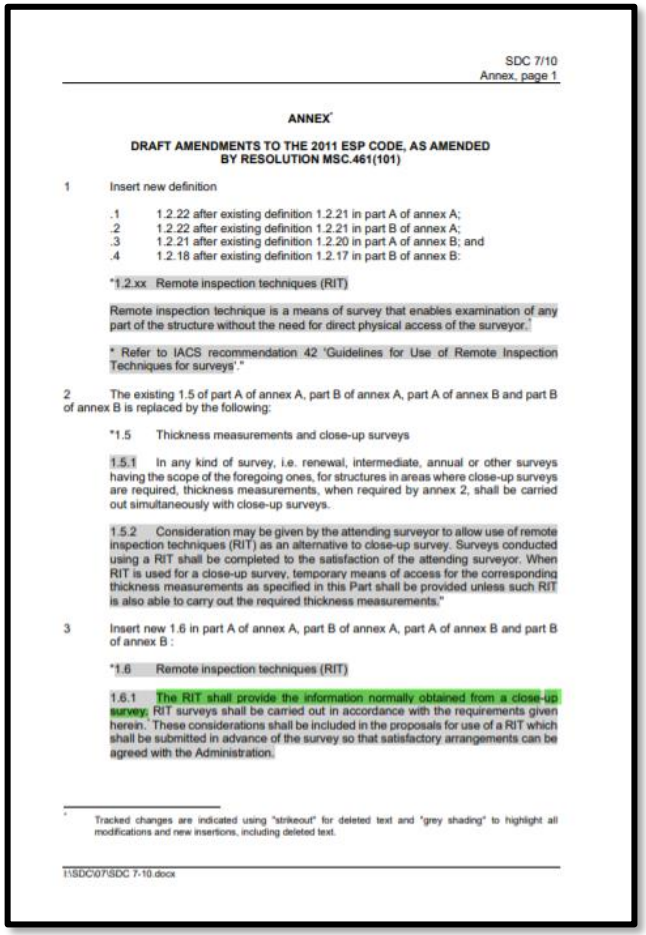
SUB-COMMITTEE ON SHIP DESIGN AND CONSTRUCTION
7th session
Agenda item 10

SDC 7/10
29 November 2019
Original: ENGLISH
Pre-session public release: ☒

AMENDMENTS TO THE 2011 ESP CODE

Use of Remote Inspection Techniques (RITs)

Submitted by IACS



SDC 7/10
Annex, page 1

ANNEX*

DRAFT AMENDMENTS TO THE 2011 ESP CODE, AS AMENDED BY RESOLUTION MSC.461(101)

1 Insert new definition

.1 1.2.22 after existing definition 1.2.21 in part A of annex A;
.2 1.2.22 after existing definition 1.2.21 in part B of annex A;
.3 1.2.21 after existing definition 1.2.20 in part A of annex B; and
.4 1.2.18 after existing definition 1.2.17 in part B of annex B:

"1.2.xx Remote inspection techniques (RIT)

Remote inspection technique is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor.*

* Refer to IACS recommendation 42 'Guidelines for Use of Remote Inspection Techniques for surveys'."

2 The existing 1.5 of part A of annex A, part B of annex A, part A of annex B and part B of annex B is replaced by the following:

"1.5 Thickness measurements and close-up surveys

1.5.1 In any kind of survey, i.e. renewal, intermediate, annual or other surveys having the scope of the foregoing ones, for structures in areas where close-up surveys are required, thickness measurements, when required by annex 2, shall be carried out simultaneously with close-up surveys.

1.5.2 Consideration may be given by the attending surveyor to allow use of remote inspection techniques (RIT) as an alternative to close-up survey. Surveys conducted using a RIT shall be completed to the satisfaction of the attending surveyor. When RIT is used for a close-up survey, temporary means of access for the corresponding thickness measurements as specified in this Part shall be provided unless such RIT is also able to carry out the required thickness measurements."

3 Insert new 1.6 in part A of annex A, part B of annex A, part A of annex B and part B of annex B :

"1.6 Remote inspection techniques (RIT)

1.6.1 The RIT shall provide the information normally obtained from a close-up survey. RIT surveys shall be carried out in accordance with the requirements given herein. These considerations shall be included in the proposals for use of a RIT which shall be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Administration.

* Tracked changes are indicated using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

I:\SDC\07\SDC 7-10.docx

3. Problem

② IMO's Regulation – IACS UR Z17 R13 'Service Suppliers'

Z17 (1997) (Rev.1 June 1999) (Rev.2 Nov 1999) (Rev.3 July 2002) (Rev.4 July 2003) (Rev.5 Feb 2004) (Rev.6 June 2007) (Rev.7 Nov 2007)

Procedural Requirements for Service Suppliers

CONTENTS

Referred about Service Suppliers'

- ✓ **Training and qualification of operators**
- ✓ **Procedures and guidelines -** how to plan, carry out and report inspections, operate the equipment, collection and storage of data
- ✓ **Documentation and Records** that The supplier shall maintain
- ✓ **Verification**

→ Service Supplier content of Z17 R13 is missing in ESP CODE

3. Problem

② IMO's Regulation – SOLAS CHAPTER IV

CHAPTER IV

Radiocommunications

.5 *General radiocommunications* means operational and public correspondence traffic, other than distress, urgency and safety messages, conducted by radio.

Regulation 5

Provision of radiocommunication services

1 Each Contracting Government undertakes to make available, as it deems practical and necessary either individually or in co-operation with other Contracting Governments, appropriate shore-based facilities for space and terrestrial radiocommunication services having due regard to the recommendations of the Organization**. These services are:

** Refer to the resolution A.801(19) concerning provision of radio services for the global maritime distress and safety system(GMDSS).

.1 a radiocommunication service utilizing geostationary satellites in the Maritime Mobile-Satellite Service;

.2 a radio communication service utilizing polar orbiting satellites in the Mobile-Satellite Service;

.3 the Maritime Mobile Service in the bands between 156MHz and 174MHz;

.4 the Maritime Mobile Service in the bands between 4,000kHz and 27,500kHz; and

.5 the Maritime Mobile Service in the bands between 415kHz and 535kHz*** and between 1,605kHz and 4,000kHz.

Regulation 16

Radio personnel

1 Every ship shall carry personnel qualified for distress and safety radiocommunication purposes to the satisfaction of the Administration.* The personnel shall be holders of certificates specified in the Radio Regulations as appropriate, any one of whom shall be designated to have primary responsibility for radiocommunications during distress incidents.

Existing concept of maritime radiocommunication only applies to **Maritime Mobile Service (disaster relief)** using **GMDSS**

in the bands between **156MHz and 174MHz** (VHF)

A role regulation for the **Radio Personnel**

3. Problem

② IMO's Regulation

– IMO 2018-2023 Strategic Direction 'Planned Outputs'

	Output number	Description	Parent organ	Associated organ(s)
<SD2> Integrate new and advancing technologies in the regulatory framework	2.1	Response to matters related to the Radiocommunication ITU-R Study Group and ITU World Radiocommunication Conference	MSC	NCSR
	2.10	Revision of SOLAS chapters III and IV for Modernization of the GMDSS, including related and consequential amendments to other existing instruments (2021)	MSC	HTW/SSE
<Other work>	OW2	Amendments to the ESP Code	MSC	SDC/ III

3. Problem

Research method

3. Problem

③ Working Group Interview

	Classification Society [2020.09.08]	Radiocommunication Research Institute [2020.09.10]
Service Supplier	Related regulations would be **necessary if the significance of role increases** as the RIT expands	**Necessary to secure the safety** of frequency indirectly by regulating the role of service supplier
Radio communication	(= **Does not aware of the problem related to radio communication** from a short-term perspective)	The concept of RIT radiocommunication requires **step by step discussion** for a proactive response to related accidents **securing the safety** of UAV frequency bands(ISM BAND) is **essential** because radio interference occur when RIT inspection expands

Service supplier

① Define the roles in survey to prepare for liability issues in the event of an accident

Radio communication

① Define the concept of RIT radiocommunication

② Specify the role of Service Supplier about frequency security'

3. Problem

Comparing Study Results

	Classification Societies' Guideline	IMO Regulation	Working Group Interview
Service Supplier	Each Acceptance Criteria and role is different.	Only revised in IACS UR Z17 R13	Specify the role of service suppliers
Radio Communication	No mention about the safety of frequency mostly	The existing maritime radiocommunication is only for rescue purposes.	① Define the concept of RIT radiocommunication ② Specify the role of Service Supplier about frequency security

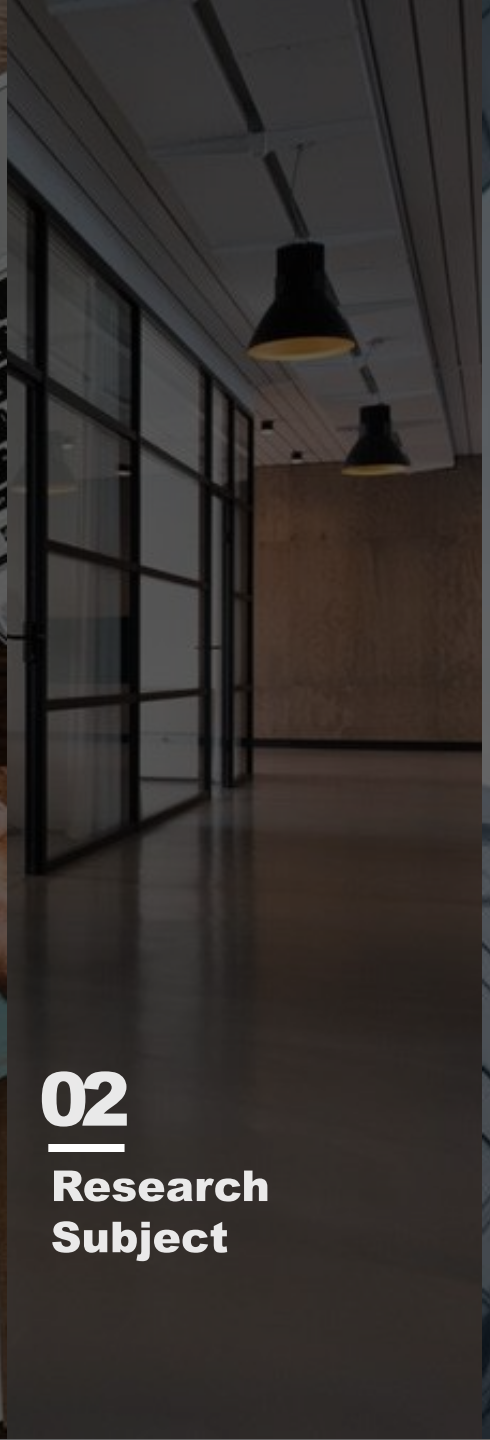
IMO Convention Is required

Gap between IMO Regulation and in practice

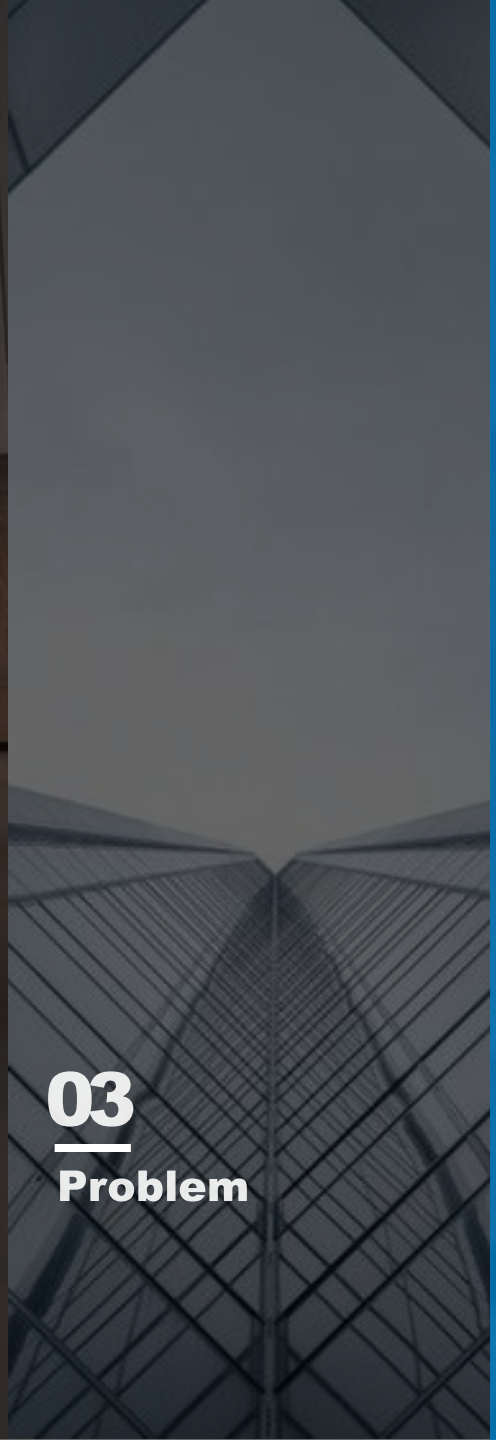
We need globally recognized standards for safe commercialization

Before the amendment triggered by an accident happens

01
Background



02
Research
Subject

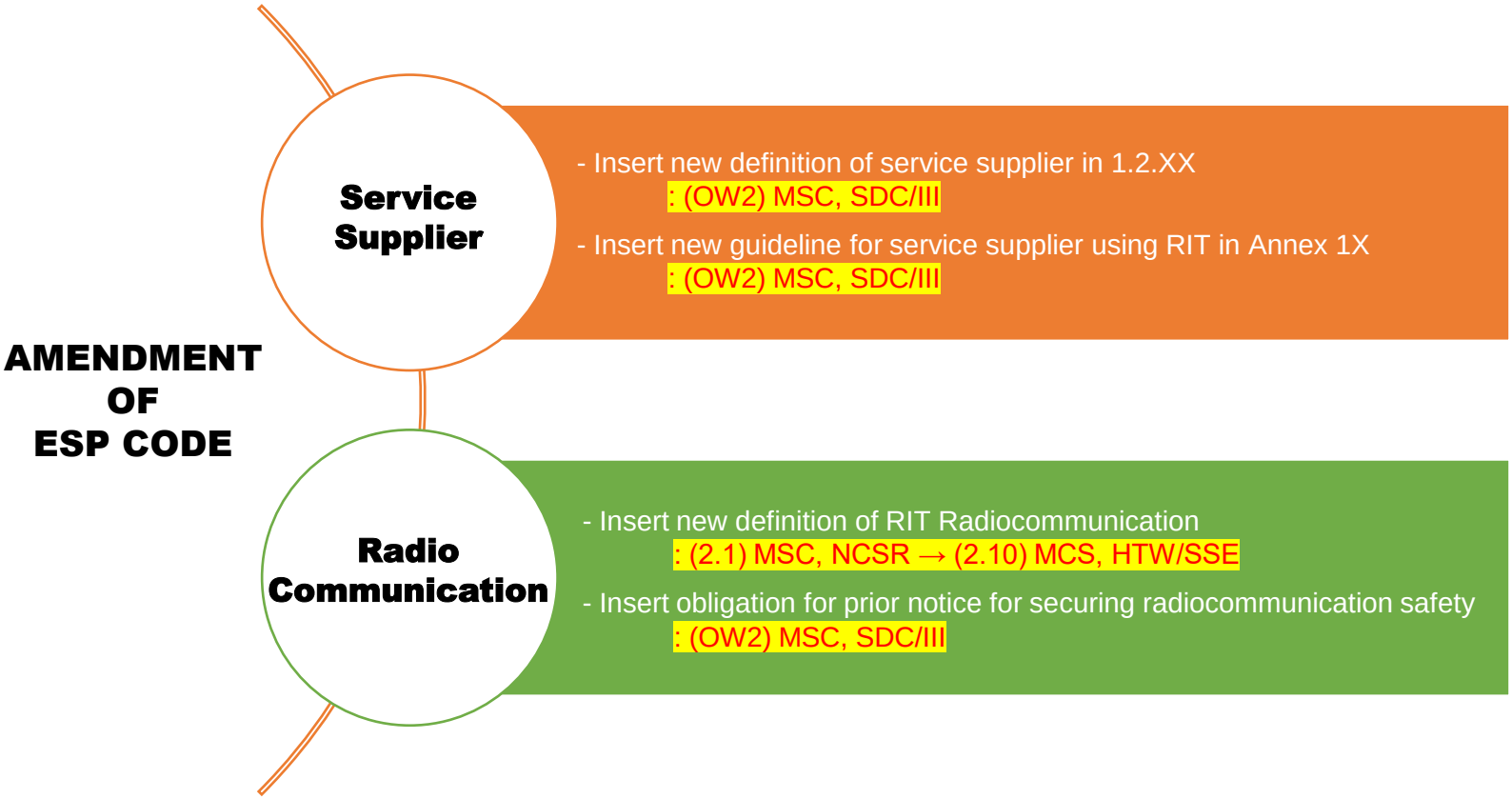


03
Problem

04
Proposal
& Conclusion

4-1. Proposal

Summary



4-1. Proposal

① Service Supplier

IACS UR Z17 R13
'Service Suppliers'
(2018.1)

- Training and qualification
- Procedures and guidelines
- Documentation and Records
- Verification

ESP CODE(2011)
Special measures to enhance maritime safety
(2019.11)

- Definition of RIT
- Realm of Use of RIT
- procedure using RIT
- Pre-check the environment for using RIT

Procedural Requirements for Service Suppliers Refers to IACS UR Z17

4-1. Proposal

① Service Supplier

INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS, 2011 (2011 ESP CODE)

Resolution A.1049(27)

Adopted on 30 November 2011

"1.2.xx Remote inspection techniques (RIT)

Remote inspection technique is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor.*

* Refer to IACS recommendation 42 'Guidelines for Use of Remote Inspection Techniques for surveys'."

"1.2.XX Service Supplier (A Service Supplier or category of Service Supplier may be referred to here after simply as 'supplier'):

* Refer to IACS Z17 'Procedural Requirements for Service Suppliers'."

Insert new definition of service supplier in 1.2.XX

ANNEX 1X

"Procedures and Guidelines for Service Supplier using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey"

-Procedures and guidelines
-Documentation and records
-Verification

Insert new guideline for service supplier using RIT in Annex 1X

4-1. Proposal

② Radiocommunication

SOLAS CHAPTER IV. Radiocommunications	RIT Radiocommunications	
Maritime Mobile Service	Inspection Technology	→ New concept & Definition
Bands between 156MHz and 174MHz (VHF)	2.4GHz, 5.8GHz 'ISM Band'	→ New frequency "ISM BAND"
A role regulation for the Radio Personnel	Secure radiocommunication safety with service supplier from a short-term	→ Need role of Service Supplier

GMDSS needs amendment
in terms of RIT′s screen transmission, data traffic, safety, and speed
(SD 2.10)

4-1. Proposal

② Radiocommunication

INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS, 2011 (2011 ESP CODE)

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1.2.XX RIT Radiocommunication
Communication by means of radio waves during RIT inspection

1.4 *Surveyors*

For bulk carriers of 20,000 tons deadweight and above, two surveyors should jointly carry out the first scheduled renewal survey after the bulk carrier passes 10 years of age (i.e. third renewal survey), and all subsequent renewal surveys and intermediate surveys. On bulk carriers of 100,000 tons deadweight and above, the intermediate survey between 10 and 15 years of age should be performed by two surveyors. If the surveys are carried out by a recognized organization, the surveyors should be exclusively employed by such recognized organizations.

1.4.2 RIT Operators
In the case of using remote inspection technology as an alternative to close-up survey, the specialized supplier shall apply the test before conducting the test.
The safety of radio waves in the ISM BAND band should be secured and announced in advance.

Insert new definition of RIT Radiocommunication

Insert obligation for prior notice for securing radiocommunication safety

4-1. Proposal

Urgency & Action required

- ✓ **In this regard, the new output could be included in the Strategic Plan's list of outputs for the upcoming biennium**
- ✓ **The upcoming provisional agenda for the III Subcommittee and Committee, for completion.**

<Urgency>

<Action Required>

4-2. Conclusion

Benefits

Service Supplier

A. Protection by globally recognized standard.

- Short-term perspective: guaranteeing the rights of service supplier.
- Long-term perspective: Reducing disaster regarding **responsibility of accident.**

B. Promote Consistent Implementation

- The legal enactment of the concept of service supplier would contribute to RO and maritime education for service supplier.

Radiocommunication

A. Successful RIT cyber security management through the regulation regarding frequency.

- Short-term perspective: reducing the probability of accidents due to communication problems.
- Long-term perspective: solving cyber security problems related to digitization.

Reference

[Mainbody Refrences]

1. Pert 1 shipment's group infection (Busan, Korea) - NEWS 1

2. Diamond Princess shipment's infection (Japan) - KBS news

3. Reported Material : Circular Letter No.4231/Add.10 21 August 2020 - Ministries of Oceans and Fisheries /

4. IMO/ MKC Current Awareness Bulletin (CAB)

5.https://ww2.eagle.org/en/Products-and-Services/digital-solutions/Corrosion-Detection.html

6. IACS (Rev.2 2007); CONFINED SPACE SAFE PRACTICE - IACS

7. Survey by remote inspection techniques : use of approved service suppliers - DNV GL

8. Research - Lloyd's register (organized by safety4sea)

9. Drone surveys : the safer and smarter way - DNV GL

10. Survey by remote inspection techniques : use of approved service suppliers - DNV GL

11. Seadrone; CLASS SOCIETIES AND REMOTE INSPECTION TECHNIQUES August 24, 2020

12. Korea Coast Guard - Public data news

13.IACS(No.42); Guidelines for Use of Remote Inspection Techniques for surveys - IACS

14. Guideline of RIT - KR, ABS, LR, DNV GL, NK

15. AMENDMENTS TO THE 2011 ESP CODE 'Use of Remote Inspection Techniques (RITs)' - IACS

16. IACS UR Z17 R13 'Service Suppliers' - IACS

17. SOLAS CHAPTER IV Radiocommunications - IMO

18. 5 Functions to developing cybersecurity strategy – NIST

[ANNEX References]

1. IMO/ MKC Current Awareness Bulletin (CAB)

2. IACS(No.42); Guidelines for Use of Remote Inspection Techniques for surveys

3. The United Nations Economic Commission for Europe (UNECE press Published: 02 May 2020

4.UNCTAD; Digitalization in Maritime Transport: Ensuring Opportunities for Development

THANK YOU

Annex

1. Background – COVID 19 preparation strategies of flag states

Peru, extends the validity period of, port inspection certificates

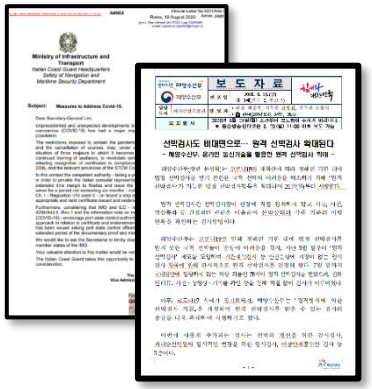
(CL No.4296, '20.5.29).

Nigeria, extended the ship certificates, etc. as part of its response

(CL No. 4271/Add.2, '20.7.28)

India, The ship certificate, which expires on '20.6.30' had been extended to '20.8.31' and further extension will be increased

(CL No. 4254/Add.4, '20.7.14)



Italy, ship certificates extension and inspection of the port bureau.
In addition, they proposed guidelines for RIT and Remote Survey to IMO
(CL No. 4231/Add.10, '20.8.24).

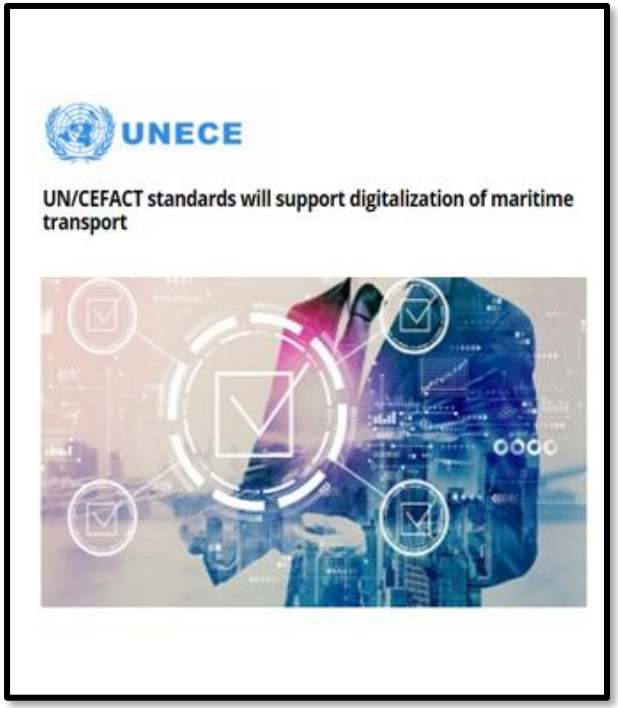
Annex

2. Research Subject - Remote survey VS RIT

Remote survey		RIT
Class Surveyor	**Operator**	service provider
Indirect Inspection	**Format**	Indirect Inspection (iOT based on radiocommunication)
Interview and ICT equipment (video, camera, scanner)	**Service equipment**	UAV, ROV, Robot arm
Occasional Inspection	**Service type**	Close-up Survey of Special Survey
Minor Damage Survey	**Service scope**	Ballast and cargo tanks Cargo holds Jack-up legs
Limited number of surveyors, Low cost	**Pros**	Improved data analytics with machine learning
Lack of safety because most of the surveys are taken by simple interviews and pictures	**Cons**	Expensive cost

Annex

2. Research Subject - Digitization of maritime industry



A Study on the Digitization of Maritime Industry
in UNECE and UNCTAD

Annex

2. Research Subject – Industry Standard

Z17 **Procedural Requirements for Service Suppliers**

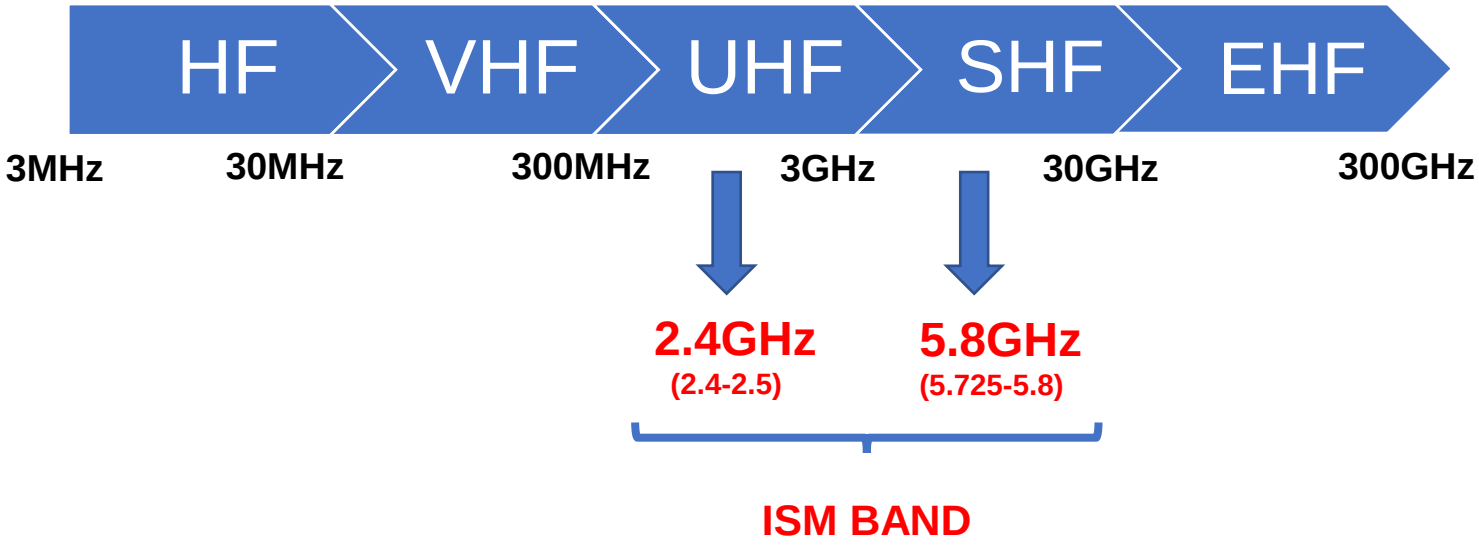
(1997)
(Rev.1 June 1999)
(Rev.2 Nov 1999)
(Rev.3 July 2002)
(Rev.4 July 2003)
(Rev.5 Feb 2004)
(Rev.6 June 2007)
(Rev.7 Nov 2007)

CONTENTS

There are no other industry provisions or standards applicable to the proposed output other than **IACS UR Z17 R13**.

Annex

3. Problem – How does RIT communicate? ISM BAND



Using 2.4GHz, 5.8GHz ***'ISM Band'*** for AGV(Drone) Operation
ISM Band can be used without a special license.

Annex

3. Problem – How does RIT communicate? ISM BAND

ISM BAND is unified worldwide

Annex

3. Problem - Working Group Interview : Classification Society

Q. How does Classification Society **define the relationship between Classification Society and the service supplier**? Is there a regulation of the role of service suppliers existing?

A. We don't have a service suppliers' role regulation and responsibility because **Classification Society outsources them entirely in terms of technology**. We only specifies drone insurance for accident handling.

We believe that related regulations would be required if RIT expands and the outsourcing ratio increases from a long-term perspective.

Q. How does Classification Society **recognizes the safety problem** when using RIT radiocommunication?

A. Since it is not universal method of inspection yet, we haven't been conducting multiple RIT equipment at one time. For that, we don't think considering frequency and radio interference issues are **not yet problems at hand.**

B. However, we have revised drone insurance policy to prepare for the expansion of RIT.

Annex

3. Problem - Working Group Interview
: Radiocommunication Research Institute

Q. Different concept of radiocommunication with conventional maritime radio communication has emerged. Do you think it's **required to secure a concept and revise the frequency band**?

A. Since new concept has emerged, we think **it's natural to secure the definition from the legal perspective.**

B. International regulations are not necessary about the **drone which frequency is in 'ISM BAND' that doesn't need license.**

C. However, from the **long term**, **securing the safety of the ISM band is essential** because radio interference would occur when many inspection devices use ISM BAND simultaneously as the expansion of RIT inspection.

Q. So do you think that **indirectly regulating them to ensure the safety of ISM band is required**?

A. **Yes**. It would be possible to ensure the safety of frequency indirectly **by defining it as the role of a service supplier** who is in charge of operating it.

Annex

4. Proposal - ① Service supplier amendment simulation

INTERNATIONAL CODE ON THE ENHANCED PROGRAMME OF INSPECTIONS DURING SURVEYS OF BULK CARRIERS AND OIL TANKERS, 2011 (2011 ESP CODE)

Resolution A.1049(27)

Adopted on 30 November 2011

"1.2.xx Remote inspection techniques (RIT)

Remote inspection technique is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor.*

* Refer to IACS recommendation 42 'Guidelines for Use of Remote Inspection Techniques for surveys'."

"1.2.XX Service Supplier (A Service Supplier or category of Service Supplier may be referred to here after simply as 'supplier'):

A person or company, not employed by an IACS Member, who at the request of an equipment manufacturer, shipyard, vessel's owner or other client acts in connection with inspection work and provides services for a ship or a mobile offshore drilling unit such as measurements, tests or maintenance of safety systems and equipment, the results of which are used by surveyors in making decisions affecting classification or statutory certification and services.

* Refer to IACS Z17 'Procedural Requirements for Service Suppliers'."

1. Insert new definition of Service Supplier

.1 1.2.23 after existing definition 1.2.22 in part A of annex A;
.2 1.2.23 after existing definition 1.2.22 in part B of annex A;
.3 1.2.22 after existing definition 1.2.21 in part A of annex B; and
.4 1.2.19 after existing definition 1.2.18 in part B of annex B:

Annex

4. Proposal - ① Service supplier amendment simulation : Procedure Requirements for Service Supplier

Insert new :
Annex 16 in part A of annex A,
Annex 13 in part B of annex A, part A of annex B and part B of annex B:

ANNEX 1X

"Procedures and Guidelines for Service Supplier using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey“

-Procedures and guidelines
-Documentation and records
-Verification

Annex

4. Proposal - ① Service supplier amendment simulation : Procedure Requirements for Service Supplier

ANNEX 1X

"Procedures and Guidelines for Service Supplier
using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey“

Procedures and guidelines

16.8 Procedures and guidelines – The supplier shall have documented operational procedures and guidelines for how to plan, carry out and report inspections; how to handle/operate the equipment; collection and storage of data. These shall include:

- Requirements for preparation of inspection plans when UAV are part of the equipment flight plans shall be included.
- Operation of the remotely operated platforms.
- Operation of lighting.
- Calibration of the data collection equipment.
- Operation of the data collection equipment.
- Two-way communication between the operator, platform, Surveyor, other personnel such as support staff and ships officers and crew.
- Guidance of the operator to provide complete coverage of the structure to be inspected.
- Guidance for the maintenance of the remotely operated platforms, data capture and storage devices and display screens, as applicable.
- Requirements for the collection and validation of data.
- If data is to be stored, then requirements for location attribution (geo-tagging), validation and storage of data.
- Requirements for the reporting of inspections, including the recording of damages and defects found during inspection and repair work.

Documentation, Records ,Verification

16.9 Documentation and records - The supplier shall maintain the following:

- Records of training.
- Operator statutory and regulatory certificates and licences.
- Equipment register for UAVs, Robots, data collection devices, data analysis devices and any associated equipment necessary to perform inspections.
- Equipment maintenance manuals and records / logbook.
- Records of calibration.
- UAV / Robot operation logbook.

Knowledge of the following shall be documented:

- Marine and/or offshore nomenclatures.
- The structural configuration of relevant ships types and MOUs, including internal structure.
- The remote inspection equipment and its operation.
- Survey plans for examination of hull spaces of various configurations, including appropriate flight plans if using a UAV.
- Thickness measurement (TM) and non-destructive examination (NDE) in accordance with a recognised National or International Industrial NDE Standard when these are part of the service. Suppliers undertaking TMs are to hold separate approval as a ‘Firm engaged in thickness measurements on ships’ (see Annex 1, Section 1).

16.10 Verification – The supplier must have the Surveyor’s verification of each separate job, documented in the report by the attending Surveyor(s) signature.