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**GUIDANCE ON THE SURVEY AND CERTIFICATION OF COMPLIANCE OF SHIPS
WITH THE REQUIREMENT TO TRANSMIT LRIT INFORMATION**

1 The Maritime Safety Committee (the Committee), at its eighty-fourth session (7 to 16 May 2008), considered a number of issues which have arisen as a result of the requirement of SOLAS regulation V/19-1.6 which specifies that the shipborne equipment to be used for transmitting LRIT information should be of a type approved by the Administration, and approved the Guidance on the survey and certification of compliance of ships with the requirement to transmit LRIT information (the Guidance) as set out in the annex.

2 The Guidance outlines a number of alternative options for documenting compliance with the aforesaid requirement and sets out the approach to be taken when surveying and certifying the compliance of ships which are required to transmit LRIT information with the aforesaid obligation. The Guidance should be read together with SOLAS regulation V/19-1 and the Revised performance standards and functional requirements for the long-range identification and tracking of ships (Revised performance standards) adopted by resolution MSC.263(84).

3 The Committee also agreed to keep the Guidance under review and amend it as and when the circumstances so warrant.

4 SOLAS Contracting Governments are invited to bring the present circular and its annex to the attention of Recognized Organizations which they have authorized to act on their behalf and to provide to such Recognized Organizations any necessary further guidance and instruction so as to ensure that the objectives of this circular are achieved.

5 SOLAS Contracting Governments are also invited to bring the present circular and the salient parts of its annex to the attention of Companies operating ships entitled to fly their flag which are required to transmit LRIT information and to provide to such Companies any necessary further guidance and instruction so as to ensure that the objectives of this circular are achieved.

6 SOLAS Contracting Governments should communicate to the Organization as soon as possible the names and contact details of the Application Service Providers they have either recognized within the framework of the Revised performance standards or they have authorized to conduct conformance testing as set out in the attached Guidance, together with any conditions attached to such recognitions or authorizations and update the information as and when changes occur.

7 SOLAS Contracting Governments, international organizations and non-governmental organizations with consultative status are also invited to bring to the attention of the Committee, at the earliest opportunity, the results of the experience gained from the use of the Guidance for consideration of action to be taken.

ANNEX

GUIDANCE ON THE SURVEY AND CERTIFICATION OF COMPLIANCE OF SHIPS WITH THE REQUIREMENT TO TRANSMIT LRIT INFORMATION

1 Introduction

1.1 This note provides guidance to Contracting Governments in relation to the survey and certification of the compliance of ships, high-speed craft and mobile offshore drilling units entitled to fly their flag with the obligation to transmit LRIT information.

1.2 In addition, this note provides salient information which would enable Companies operating ships, owners and operators of high-speed craft and owners and operators of mobile offshore drilling units which are required to comply with the obligation to transmit LRIT information to ensure the survey and certification of their compliance in a timely manner.

1.3 In relation to mobile offshore drilling units, the provisions of this note apply subject to the modifications set out in section 11.

2 Related documents

2.1 The provisions relating to the survey and certification of compliance of ships with the obligation to transmit LRIT information are set out in:

- .1 Regulation V/19-1 on long-range identification and tracking of ships;
- .2 Revised performance standards and functional requirements for the long-range identification and tracking of ships adopted by resolution MSC.263(84) (the Revised performance standards);
- .3 Resolution A.694(17) on Recommendations on general requirements for shipborne radio equipment forming part of the global maritime distress and safety system (GMDSS) and for electronic navigational aids;
- .4 Resolution A.813(19) on General requirements for electromagnetic compatibility of all electrical and electronic ship's equipment;
- .5 Resolution MSC.216(82) on Adoption of amendments to the International Convention for the Safety of Life at Sea, 1974, as amended, which sets out in annex 1 amendments (amendments 50 to 52) inserting in the Record of Equipment for the Passenger Ship Safety Certificate (Form P), the Record of Equipment for the Cargo Ship Safety Equipment Certificate (Form E) and the Record of Equipment for the Cargo Ship Safety Certificate (Form C) an entry to indicate compliance with long-range identification and tracking systems;

- .6 Resolution MSC.221(82) on Adoption of amendments to the International Code of Safety for High-Speed Craft (1994 HSC Code) which sets out in the annex an amendment (amendment 9) inserting in the Record of Equipment for High-Speed Craft Safety Certificate an entry to indicate compliance with Long-range identification and tracking systems; and
- .7 Resolution MSC.222(82) on Adoption of amendments to the International Code of Safety for High-Speed Craft, 2000 which sets out in the annex an amendment (amendment 148) inserting in the Record of Equipment for High-Speed Craft Safety Certificate an entry to indicate compliance with Long-range identification and tracking systems.

3 Definitions

3.1 Unless indicated otherwise for the purposes of this note:

- .1 *Authorized testing ASP* means an Application Service Provider, other than a Recognized ASP which has been authorized by the Administration to conduct conformance tests in accordance with this note and for which related information has been communicated to the Organization in accordance with the provisions of paragraph 6.2.
- .2 *Certificate* means the Passenger Ship Safety Certificate, Cargo Ship Safety Equipment Certificate, Cargo Ship Safety Certificate and High-Speed Craft Safety Certificate issued under the provisions of the International Code of Safety for High-Speed Craft or the International Code of Safety for High-Speed Craft, 2000;
- .3 *Chapter* means a chapter of the Convention;
- .4 *Contracting Government* means a Contracting Government to the Convention.
- .5 *Convention* means the International Convention for the Safety of Life at Sea, 1974, as amended;
- .6 *Radio related certificate* means the Passenger Ship Safety Certificate, Cargo Ship Safety Radio Certificate, Cargo Ship Safety Certificate and High-Speed Craft Safety Certificate issued under the provisions of the International Code of Safety for High-Speed Craft or the International Code of Safety for High-Speed Craft, 2000;
- .7 *Record of Equipment* means the Record of Equipment for the Passenger Ship Safety Certificate (Form P), the Record of Equipment for the Cargo Ship Safety Equipment Certificate (Form E), the Record of Equipment for the Cargo Ship Safety Certificate (Form C) and the Record of Equipment for High-Speed Craft Safety Certificate issued under the provisions of the International Code of Safety for High-Speed Craft or the International Code of Safety for High-Speed Craft, 2000;

- .8 *Recognized ASP* means an Application Service Provider which has been recognized by the Contracting Government concerned pursuant to the provisions of paragraphs 5.1.1 and 5.1.2 of the Revised performance standards and for which related information has been communicated to the Organization in accordance with the provisions of paragraph 5.2 of the Revised performance standards;
- .9 *Regulation* means a regulation of the Convention;
- .10 *Ship* refers to ships, high-speed craft and mobile offshore drilling units which are required to comply with the provisions of regulation V/19-1.

3.2 Terms used in this note not otherwise defined have the meaning assigned to them in chapters I, IV and V or in the Revised performance standards.

4 Shipborne equipment to be of a type approved by the Administration

4.1 Regulation V/19-1.6 specifies that the shipboard equipment to be used to transmit LRIT information (shipborne equipment) shall be of a type approved by the Administration.

4.2 Compliance of the shipborne equipment with the requirements of regulation V/19-1.6 should be demonstrated by the equipment being:

- .1 of a type approved by the Administration in accordance with the provisions of regulation V/19-1 and section 4 of the Revised performance standards; or
- .2 certified by the Administration as meeting the requirements of regulation IV/14 and satisfactorily completing a conformance test in accordance with the procedures and provisions set out in appendix 1; or
- .3 certified by the Administration as meeting the requirements of IEC 60945 (2002-08) and IEC 60945 Corr.1 (2008-04) on Maritime navigation and radiocommunication equipment and systems – General requirements - Methods of testing and required test results and satisfactorily completing a conformance test in accordance with the procedures and provisions set out in appendix 1.

5 Conformance test

5.1 The conformance test should be conducted either by a recognized ASP or by an authorized testing ASP.

5.2 For ships constructed on or after 31 December 2008, the conformance test should be:

- .1 conducted after the completion of the initial survey of the radio installation, provided such survey has indicated that, as far as the radio installation is concerned, the ship meets the related requirements for the issue of a radio related certificate; and
- .2 satisfactorily completed prior to the issue of a radio related certificate.

- 5.3 For ships constructed before 31 December 2008, the conformance test should be:
- .1 conducted within a period of three months prior to the date on which a ship would need to demonstrate compliance with the requirements of regulation V/19-1; and
 - .2 satisfactorily completed prior to the amendment of the record of equipment to document compliance with the requirements relating to Long-range identification and tracking system.

6 Communication of information in relation to Application Service Providers

6.1 Unless the Administration concerned informs the Organization otherwise, recognized ASPs should be automatically considered as being authorized by the Administration concerned to conduct conformance tests in accordance with the provisions of this note.

6.2 Administrations should provide to the Organization a list with the names and contact details of the authorized testing ASPs together with any associated conditions of authorization and thereafter should, without undue delay, update the Organization as changes occur.

6.3 The Organization should communicate the information it receives pursuant to the provisions of paragraph 5.2 of the Revised performance standards and the information it receives pursuant to paragraphs 6.1 and 6.2 to all Contracting Governments, international organizations and non-governmental organizations with consultative status.

7 Conformance test report

7.1 On satisfactory completion of a conformance tests, the ASP conducting the test should issue a Conformance test report on behalf of the Administration in accordance with the model set out in appendix 2.

7.2 The Conformance test report should be considered as no longer remaining valid if:

- .1 there is a change in the shipborne equipment used to transmit LRIT information;
- .2 the ship is transferred to the flag of another Contracting Government, subject to the provisions of paragraph 10.1;
- .3 the ASP which has issued the Conformance test report has notified the Administration or the Recognized Organization who, acting on behalf of the Administration, has issued the certificate is no longer in a position to attest the validity of the report; and
- .4 the Administration has withdrawn the recognition or authorization of the ASP which conducted the conformance test. However, in such cases the Administration concerned may decide that the Conformance test report, issued either prior to the date of withdrawal of such recognition or authorization or prior to a date determined by the Administration, remain valid subject to these being considered as being the responsibility of Administration.

7.3 Administration choosing to use the services of authorized testing ASPs should ensure that the recognized ASP(s) are able to integrate into the LRIT system the ships to which an authorized testing ASP has issued Conformance test reports.

8 Initial certification of compliance on or after 31 December 2008

8.1 The conformance test has been designed to also demonstrate compliance of the shipborne equipment with the functional requirements of V/19-1.5 and section 4 of the Revised performance standards.

8.2 For ships constructed on or after 31 December 2008, prior to the issue of a certificate, the shipborne equipment should satisfactorily complete a conformance test in accordance with the procedures and provisions set out in appendix 1 within the periods specified in paragraph 5.2.

8.3 For ships constructed before 31 December 2008, prior to the amendment of the record of equipment associated with a valid certificate or the renewal of a certificate in case it is also due, the shipborne equipment should satisfactorily complete a conformance test in accordance with the procedures and provisions set out in appendix 1 within the period specified in paragraph 5.3 and the survey of the radio installation has indicated that, as far as the radio installation is concerned, the ship meets the related requirements for the renewal or endorsement of the radio related certificate.

8.4 Notwithstanding paragraphs 8.2 and 8.3, shipborne equipment which has already satisfactorily completed a conformance test for the purposes of demonstrating compliance with the requirement to be of a type approved by the Administration (refer to paragraphs 4.2.2 and 4.2.3) are not required to undergo any further conformance test, provided such tests have been conducted within the periods specified in paragraphs 5.2 or 5.3, as the case may be.

9 Renewal and annual survey after the initial certification of compliance

9.1 During any renewal or annual survey following the initial certification of compliance of a ship with the requirements of regulation V/19-1, the related certificate should be issued or endorsed, as the case may be, provided the Conformance test report is still valid taking into account the provisions of paragraph 7.2.

10 Transfer of flag

10.1 When a ship is transferred to the flag of another Contracting Government, the Conformance test report should be considered as remaining valid if the ASP which conducted the conformance test is also either a recognized ASP or an authorized testing ASP by the Contracting Government to whose flag the ship is transferred.

10.1.1 In such cases the ASP concerned should reissue the Conformance test report on behalf of the Administration concerned henceforth indicating the new particulars of the ship but without altering the date of completion of the conformance test.

10.2 In cases where the Conformance test report is deemed to be no longer valid, due to the transfer of the flag to another Contracting Government, a new conformance test should be conducted, prior to the issue of a certificate, by either a recognized ASP or an authorized testing ASP acting on behalf of the Administration concerned.

11 Specific provisions in relation to mobile offshore drilling units

11.1 Mobile offshore drilling units may be required by the Contracting Government whose flag they may be entitled to fly to comply with the provisions of the:

- .1 national codes or requirements for the construction and equipment of mobile offshore drilling units, in case they were constructed prior 31 December 1981; or
- .2 Code for the construction and equipment of mobile offshore drilling units adopted by resolution A.414(XI) (the 1979 MODU Code); or
- .3 Code for the construction and equipment of mobile offshore drilling units, 1989 adopted by resolution A.649(16) (the 1989 MODU Code) in case their keel was laid or was at a similar state of construction on or after 1 May 1991.

11.2 The provisions of this note should apply *mutatis mutandis* to mobile offshore drilling units subject to any reference to certificate and radio related certificate in this note being read as referring:

- .1 for mobile offshore drilling units constructed on or after 31 December 2008, to the Mobile Offshore Drilling Unit Safety Certificate, 1989 issued pursuant to the provisions of the 1989 MODU Code; and
- .2 for mobile offshore drilling units constructed before 31 December 2008, to either the Mobile Offshore Drilling Unit Safety Certificate issued pursuant to the provisions of the 1979 MODU Code or the Mobile Offshore Drilling Unit Safety Certificate, 1989 issued pursuant to the provisions of the 1989 MODU Code or a certificate or document issued under a national code or requirements in case of units constructed prior to 31 December 1981, as the case may be.

11.3 As the Mobile Offshore Drilling Unit Safety Certificate and the Mobile Offshore Drilling Unit Safety Certificate, 1989 are not accompanied by a record of equipment, mobile offshore drilling units should be considered as meeting the requirements when:

- .1 the provisions of sections 4, 5 and 8 are met;
- .2 there is on board a valid certificate or document issued under a national code or requirements in case of units constructed prior to 31 December 1981, or a valid Mobile Offshore Drilling Unit Safety Certificate or a valid Mobile Offshore Drilling Unit Safety Certificate, 1989; and
- .3 there is on board a valid Conformance test report.

Appendix 1

Conformance Test

1 Shipborne equipment requirements testing matrix

1.1 The table set out below has been derived from an analysis of the salient provisions of regulation V/19-1, the Revised Performance standards and the Technical specifications for communications within the LRIT system and specifies for each regulatory requirement the conformance test to be conducted.

Table 1

Shipborne equipment regulatory requirements testing matrix

<i>Column heading</i>	<i>Explanation</i>
Ref.	Regulatory reference
Regulatory text	The text of the related provision with minor paraphrasing and <i>emphasis</i> (showing in italics)
CTN	Conformance test number

<i>Symbols</i>	<i>Explanation</i>
R	Paragraph of the related provisions of regulation V/19-1
PS	Paragraph of the related provision of the Revised Performance standards
TS	Paragraph of the related provision of the Technical specifications for communications within the LRIT system (refer MSC.1/Circ.1259 on Revised interim technical specifications for the LRIT system)
EL	Shipborne equipment lifecycle, i.e., requirements not explicitly defined in the regulatory text but critical to the successful operation of the LRIT system

Ref.	Regulatory text	CTN
R:4.1.1 to R:4.1.3	Ships shall be fitted with a system to automatically transmit the information specified in regulation V/19-1.5 as follows: ... ships constructed before 31 December 2008 and <i>certified for operations</i> in sea areas A1 to A4	1
PS:4.3	The equipment should transmit the LRIT information using a communication system which <i>provides coverage</i> where the ship operates	1
R:5	Ships shall <i>automatically</i> transmit the following long-range identification and tracking information	2
R:5.1	The <i>identity</i> of the ship	3
PS:4.2 (Table 1)	The equipment should transmit <i>the shipborne equipment identifier</i> ...	3
R:5.2	The <i>position</i> of the ship (latitude and longitude)	4a

Ref.	Regulatory text	CTN
PS:4.2 (Table 1)	Position – the equipment should be capable of transmitting the GNSS position (latitude and longitude), based upon <u>WGS84</u> datum, without human interaction on board the ship	4b
R:5.3	The <u>date and time of the position</u> provided	5a
PS:4.2(Table 1)	Date and time – the equipment should be capable of transmitting the date and time associated with the GNSS position with each transmission of LRIT information, and the time should be in <u>UTC</u>	5b
TS:2.2.2.6	The parameters provided by the equipment include: the latitude; longitude; <u>Time Stamp when the position was generated</u> ...	5c
TS: Table 2	The parameters provided by the equipment include: the latitude; longitude; <u>Time Stamp when the position was generated</u> ...	5c
R:6	Systems and equipment used to meet the requirements of regulation V/19-1 shall conform to the performance standards and functional requirements not inferior to those adopted by the Organization. Any shipboard equipment should be of a <u>type approved</u> by the Administration	6
R:7	Systems and equipments used to meet the requirements of this regulation shall be capable of being <u>switched off on board or be capable of ceasing the distribution</u>	7
PS:4.1	<u>In addition to the general requirements contained in resolution A.694(17)</u> on Recommendations on general requirements for shipborne radio equipment for part of the global maritime distress and safety system (GMDSS)	8
PS:4.1.5	<u>Be tested for electromagnetic compatibility</u> taking into account the recommendations developed by the Organization (refer to Assembly resolution A.813(19) on General requirements for electromagnetic compatibility of all electrical and electronic ship's equipment)	8
PS:4.2 (Table 1)	Pre-scheduled position reports – the equipment should be capable of being remotely configured to transmit LRIT information at intervals ranging from a <u>minimum of 15 min</u> to periods of 6 h to the LRIT Data Centre, irrespective of where the ship is located and without human interaction on board the ship	9a
PS:4.1.2	Be capable of <u>being configured remotely</u> to transmit LRIT information at variable intervals	9b
TS:2.2.3.12	The “Request Type” parameter indicates whether the request is for either a one-time poll, ... <u>polls at a specified rate</u> ...	9b
PS:4.1.1	Be capable of automatically and without human intervention on board the ship transmit the ship's LRIT information at <u>6-hour intervals</u> to an LRIT Data Centre	9c
PS:4.4.1	When a ship is undergoing repairs in dry-dock or in port or is laid up for a long period, the master or the Administration may reduce the frequency of the transmission of LRIT information to <u>one report every 24-hour period</u> ...	9d

Ref.	Regulatory text	CTN
PS:13.1	LRIT information should be available to an LRIT Data User <i>within 15 min</i> of the time it is transmitted by the ship. In lieu for the purposes of testing to an ASP	9e
PS:4.1.3	Be capable of <i>transmitting LRIT information following receipt of polling commands ...</i>	10
PS:4.2 (Table 1)	On-demand position reports – the equipment should be capable of <i>responding to a request to transmit LRIT information</i> on demand without human interaction on board the ship, irrespective of where the ship is located	10
PS:13.2	On-demand LRIT information reports should be provided to an LRIT Data User <i>within 30 min</i> of the time the LRIT Data User requested the information. In lieu for the purposes of testing to an ASP	10
PS:4.1.4	Interface <i>directly</i> to the shipborne global navigation satellite system equipment, or have <i>internal</i> positioning capability	11
PS:4.1.5	Be <i>supplied with energy from the main and emergency source of electrical power.</i>	12
PS:4.4	The equipment should be set to automatically transmit the ship's LRIT information at 6-hour intervals <i>to the LRIT Data Centre identified by the Administration ...</i>	13
PS:5.3.1	An ASP function should, <i>inter alia</i> , provide a communication protocol interface between the <i>Communication Service Providers and the LRIT Data Centre ...</i>	13
PS:5.3.1	An ASP function should, <i>inter alia</i> , ensure that LRIT information is <i>collected, stored and routed in a reliable and secure manner ...</i>	13

2 Shipborne equipment test requirements, procedures and acceptance criteria matrix

2.1 The table set out below specifies the shipborne equipment test requirements, the related procedures and the corresponding acceptance criteria for each conformance test and provides a brief citation of the related regulatory provisions.

Table 2

Shipborne equipment test requirements, procedures and acceptance criteria

CTN	Test requirement	Acceptance criteria
	Procedure	
EL1	The equipment is activated into the ASP system ASP issuance of an activation command (Note: this function is critical during the transfer of flag process).	CSP acknowledgement received
1	Establish the sea areas the ship is certified to operate from the Cargo Ship Safety Radio Certificate, Cargo Ship Safety Certificate, Passenger Ship Safety Certificate or equivalent Administrative	Confirmed by shipowner declaration on testing registration form prior to testing including certificate type and reference number
2	The equipment automatically transmits an LRIT information Evaluative	Validated in conjunction with CTN 9
3	The equipment identity is present in the received LRIT information Evaluative	Validated in conjunction with CTN 9
4a	The latitude and longitude is present in the received LRIT information Evaluative	Validated in conjunction with CTN 9
4b	The equipment GNSS position information is based upon the WGS84 datum Evaluative	Assumed compliant in accordance with standard IMO guidelines and regulations.
5a	The date and time is present in the received LRIT information Evaluative	Validated in conjunction with CTN 9
5b	The equipment date and time information is in UTC Evaluative	Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon the confirmed inclusion of MEM code 11 (in the case of Inmarsat-C) and in the case of alternate hardware the compliance of the received message structure with the equipment manufacturers published standard for a message containing the generated Date and Time stamp.

CTN	<p style="text-align: center;">Test requirement</p> <hr/> <p style="text-align: center;">Procedure</p>	Acceptance criteria
5c	<p>The equipment transmits a Time Stamp relative to when the position was generated (not the CSP receipt time)</p> <hr/> <p>Evaluative</p>	Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon the confirmed inclusion of MEM code 11 (in the case of Inmarsat-C) and in the case of alternate hardware the compliance of the received message structure with the equipment manufacturers published standard for a message containing the generated Date and Time stamp.
6	<p>The equipment is of a type approved by the Administration</p> <hr/> <p>Administrative</p>	Forms the subject of this test specification which will be if the results are satisfactory and a Statement of conformity is issued by the ASP conducting the test (and the subsequent issuance of a Certificate of compliance by the Administration)
7	<p>The equipment is switched off on board or ceases the distribution of LRIT information</p> <hr/> <p>ASP outbound Program-Stop command</p>	CSP acknowledgement received and nil LRIT information are transmitted within 90 min
8	<p>The equipment is compliant with provisions of resolution A.694(17)</p> <p>The equipment has been tested for electromagnetic compatibility (refer to resolution A.813(19))</p> <hr/> <p>Administrative</p>	Confirmed by manufacturer or validation of technical specification
9a	<p>The equipment is re-configured to automatically transmit LRIT information at 15-min intervals</p> <hr/> <p>ASP issuance of Start-15 min reporting command</p>	Confirmed subsequent to receipt of 48 consecutive 15-min automatic transmissions of LRIT information. Refer to paragraph 3.2 for information on acceptable tolerances.
9b	<p>The equipment is re-configured to automatically transmit LRIT information at 60-min intervals demonstrating that a change in transmitting interval has been successfully achieved</p> <hr/> <p>ASP issuance of Start-60 min reporting command</p>	Confirmed subsequent to receipt of 12 consecutive 60-min automatic transmissions of LRIT information. Refer to paragraph 3.2 for information on acceptable tolerances.
9c	<p>The equipment automatically transmits a LRIT information at 6-h intervals</p> <hr/> <p>Administrative</p>	Confirmed by ASP or manufacturer or validation of the technical specification

CTN	<p style="text-align: center;">Test requirement</p> <hr/> <p style="text-align: center;">Procedure</p>	Acceptance criteria
9d	<p>The equipment is re-configured to automatically transmit LRIT information at 24 h intervals</p> <hr/> <p>Administrative</p>	Confirmed by ASP or manufacturer or validation of technical specification
9e	<p>LRIT information is available within 15 min of the time it is transmitted by the ship</p> <hr/> <p>Comparison of the UTC time stamp when the LRIT information was generated against the UTC time stamp when the information was received by the ASP</p>	Validated in conjunction with CTN 9a and 9b
10	<p>The equipment transmits LRIT information (subsequent to the ASP issuing a poll command) and the LRIT information is available within 30 min of the time the ASP has requested the information</p> <hr/> <p>ASP issuance of a Send-Request for Position command</p>	Confirmed subsequent to receipt of 1 polled transmission of LRIT information within 30 min
11	<p>The equipment interfaces directly to the shipborne global navigation satellite system equipment, or has internal positioning capability</p> <hr/> <p>Administrative</p>	Confirmed by ASP or manufacturer or by validation of technical specification if internal GPS, or if external GPS confirmed by shipowner declaration on testing registration form prior to testing.
12	<p>The equipment is supplied with energy from the main and emergency source of electrical power (this provision does not apply to Inmarsat-C)</p> <hr/> <p>Administrative</p>	Confirmed by shipowner declaration on testing registration form prior to testing
13	<p>The equipment automatically transmits LRIT information via the CSP to the ASP in a reliable and secure manner</p> <hr/> <p>Administrative</p>	Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon confirmation that all communication links from the terminal – satellite – CSP – ASP are direct and secure with no third party ASP involvement
EL2	<p>The equipment is de-activated and released from the LRIT system</p> <hr/> <p>ASP issuance of deactivation command or Administrative (Note: this function is critical during the transfer of flag process)</p>	CSP acknowledgement or CSP declaration received

3 Shipborne equipment performance acceptance criteria and tolerances

3.1 When considering the performance of the LRIT system and the implications of the performance shipborne equipment the following issues need to be taken into account:

- .1 The overall LRIT system utilizes a sophisticated array of hardware components, software systems and satellite/terrestrial communications networks, which include without limitation:
 - .1 Shipborne equipment;
 - .2 Communications satellites;
 - .3 Land Earth Stations;
 - .4 Terrestrial communication networks;
 - .5 CSP routing/switching systems; and
 - .6 ASP systems;
- .2 In common with all real world systems the overall LRIT system may suffer from data losses and data latency, i.e. non-delivery/late-delivery of messages;
- .3 Data losses in the system as a whole are result of a complex interaction of each of its components. The cause of losses can be as technical a packet collision in the space segment or as practical as an equipment blockage caused by a ship funnel or crane, in port, etc.;
- .4 In order to specify the conditions of the conformance testing scheme it should be assumed that the average loss rate of messages sent to and from the existing potential equipment is 4% in each direction. Thus the loss on a command and response pair such as Data Network Identifier (DNID) download and its acknowledgement is 8%, and the loss on an automatic LRIT information transmission is 4%;
- .5 Data latency in the system arises from the store-and-forward nature of the communication networks used. Each part of the communication chain, first stores a message and then forwards it to the next link which produces a robust system but one which has intrinsically variable latency;
- .6 In order to specify the conditions of conformance testing scheme it should be assumed that 1 h latency is within the normal operation of the system;
- .7 The design of a test for the conformance testing scheme allows for the real world performance of the overall LRIT system. Hence, it should be a design objective of the test that terminals are not incorrectly failed and thus cause shipowners to needlessly replace equipment.
- .8 Consider a poll request, it should be assumed that 8% of poll request/responses are lost therefore a fair test requires that the poll request is repeated in a sequence of attempts.

Table 3

Poll attempts and expectations

Attempt	P(Success)	P(Failure)	Expectation	Cumulative P(Success)	Cumulative Expectation
1	0.92000	0.08000	0.92000	0.92000	0.92000
2	0.07360	0.00640	0.14720	0.99360	1.06720
3	0.00589	0.00051	0.01766	0.99949	1.08486

Notes:

<i>Column heading</i>	<i>Explanation</i>
Attempt	Number of attempts
P(Success)	Probability of success on that attempt
P(Failure)	Probability of failure on that attempt
Expectation	Contribution to the expected number of attempts
Cumulative P	Cumulative probability of success
Cumulative Expectation	Cumulative expectation of number of attempts required for a successful download

- .9 Table 3 demonstrates that if the system retries the poll three times there is a 1 in 1,000 chance of wrongly failing an equipment due to statistical variation. The cumulative expectation shows that the cost of testing apparent non-compliant terminals is only increased by 8% compared to a regime which had only a single attempt;
- .10 Consequently, it is recommended that each command is retried a maximum of three times unless statistical variation can be excluded because of a network response, e.g., if the ship is in port and the equipment confirmed by the communication system as logged-out;
- .11 The ASP recognized by the Administration or approved to conduct conformance testing should properly account for different network regions. For example the Inmarsat-C network has 4 ocean regions and the test provider must ensure that they have addressed the region containing the equipment;
- .12 This calculation assumes uncorrelated failures within the network which it is assumed to be true where there is a reasonable interval between attempts. To increase the likelihood that this assumption is correct it is recommended that the system retries are separated by at least 15 min; and
- .13 A similar analysis may be performed for receipt of automatic transmission of LRIT information. The more transmission of LRIT information that are received the greater confidence there may be that the equipment is conformant while not wrongly failing units. To achieve a 1 in 1,000 confidence of wrongly failing units it is recommended that 40 out of 48 transmissions of LRIT information are received with a transmitting interval of 15 min and 10 out of 12 transmission of LRIT information with a transmission interval of 1 h.

3.2 The table set out below specifies for each conformance test the related acceptance criteria and the tolerances or limits within which the functional performance of existing equipment should be before it is considered as being acceptable.

Table 4

Shipborne equipment performance acceptance criteria and tolerances

CTN	Acceptance criteria	Tolerances
EL1	CSP acknowledgement received	Maximum of 3 attempts separated by a minimum of 15 min
1	Confirmed by shipowner declaration on testing registration form prior to testing including certificate type and reference number	None
2	Validated in conjunction with CTN 9	None
3	Validated in conjunction with CTN 9	None
4a	Validated in conjunction with CTN 9	None
4b	Assumed compliant in accordance with standard IMO guidelines and regulations.	None
5a	Validated in conjunction with CTN 9	None
5b	Confirmed by ASP recognized by the Administration or approved to conduct conformance testing based upon the confirmed inclusion of MEM code 11 (in the case of Inmarsat-C) and in the case of alternate hardware the compliance of the received message structure with the equipment manufacturers published standard for a message containing the generated Date and Time stamp.	None
5c	Confirmed by ASP recognized by the Administration or approved to conduct conformance testing based upon the confirmed inclusion of MEM code 11 (in the case of Inmarsat-C) and in the case of alternate hardware the compliance of the received message structure with the equipment manufacturers published standard for a message containing the generated Date and Time stamp.	None
6	Forms the subject of this test specification which will be if the results are satisfactory and a Statement of conformity is issued by the ASP conducting the test (and the subsequent issuance of a Certificate of compliance by the Administration)	None
7	CSP acknowledgement received and nil position reports received within 15 min	Maximum of 3 attempts separated by a minimum of 15 min
8	Confirmed by manufacturer or by validation of technical specification	None

CTN	Acceptance criteria	Tolerances
9a	Confirmed subsequent to receipt of 48 consecutive transmissions of LRIT information transmitted at 15-min intervals	3 attempts separated by a minimum of 15 min Acceptable results: a minimum of 40 out of 48 transmissions are received (>82% success rate)
9b	Confirmed subsequent to receipt of 12 consecutive transmissions of LRIT information transmitted at 60-min intervals	3 attempts separated by a minimum of 15 min Acceptable results: a minimum of 10 out of the 12 transmissions are received (>82% success rate)
9c	Confirmed by ASP or manufacturer or by validation of technical specification	None
9d	Confirmed by ASP or manufacturer of by validation of technical specification	None
9e	Validated in conjunction with CTN 9a and 9b	Satisfactory: a minimum of 50 out of 60 transmissions are received (>82% success rate)
10	Confirmed subsequent to receipt of 1 polled transmission of LRIT information within 30 min	3 attempts separated by a minimum of 15 min Satisfactory: a minimum 1 out of 1 transmissions are received (100% success rate)
11	Confirmed by ASP or manufacturer of by validation of technical specification if internal GPS, or if external GPS confirmed by shipowner declaration on testing registration form prior to testing	None
12	Confirmed by shipowner declaration on testing registration form prior to testing	None
13	Confirmed by the ASP recognized by the Administration or approved to conduct conformance testing based upon confirmation that all communication links from the equipment – satellite – CSP – ASP are direct and secure with no third party ASP involvement	None
EL2	CSP acknowledgement or CSP declaration received	3 attempts separated by a minimum of 15 min

4 Estimated duration of conformance testing

4.1 Based upon the equipment requirements testing matrix, the test requirements, the procedures, the acceptance criteria and the acceptable tolerances detailed in this annex, the table set out below provides information on the estimated duration of the conformance testing:

Table 5

Estimated duration of conformance testing

CTN	Tolerances	Maximum Duration
EL1	3 attempts separated by a minimum of 15 min	45 min
9a	3 attempts separated by a minimum of 15 min Acceptable results: a minimum of 40 out 48	45 min 720 min (12 h)
9b	3 attempts separated by a minimum of 15 min Acceptable results: a minimum of 10 out of 12	45 min 720 min (12 h)
10	3 attempts separated by a minimum of 15 min	45 min
7	3 attempts separated by a minimum of 15 min	45 min + wait 90 min
EL2	3 attempts separated by a minimum of 15 min	45 min
	<i>Total</i>	30 h

Appendix 2

Conformance test report

issued by

on behalf of the Government of

Name of ship:	
Port of registry:	
Distinctive number or letters:	
IMO Number:	
Maritime Mobile Service Identity:	
Gross tonnage:	
Sea areas in which the ship is certified to operate:	
Date of last survey of the radio installation:	
Application Service Provider conducting the test:	

THIS IS TO CERTIFY that a conformance test has been conducted in accordance with the provisions of MSC.1/Circ.1257 on Guidance on the survey and certification of compliance of ships with the requirement to transmit LRIT information and the shipborne equipment specified below has been:

- .1 found to perform within the tolerances of the acceptance criteria stated in the aforesaid circular; and
- .2 set, at the end of the conformance test to transmit LRIT information at hour interval.

Details of the shipborne equipment used to transmit LRIT information (e.g., maker model, serial number and shipborne equipment identifier):

The results of the conformance test are recorded in the attached annex.

The conformance test was satisfactorily completed on
(date of completion of testing)

Issued at on
(place of issue) (date of issue)

.....
(name and signature of authorized person issuing the report)

Annex

Conformance test results

to be developed on the basis of Table 2 of Appendix 1

CTN	Test requirement	Results
