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**PRINCIPLES AND GUIDELINES RELATING TO THE REVIEW AND AUDIT
OF THE PERFORMANCE OF LRIT DATA CENTRES AND
THE INTERNATIONAL LRIT DATA EXCHANGE**

1 The Maritime Safety Committee, at its 101st session (5 to 14 June 2019), approved amendments to the *Principles and guidelines relating to the review and audit of the performance of LRIT Data Centres and the International LRIT Data Exchange* (Principles and guidelines) (MSC.1/Circ.1412/Rev.1), prepared by the Sub-Committee on Navigation, Communications and Search and Rescue, at its sixth session (16 to 25 January 2019). This circular incorporates the aforesaid amendments.

2 The Principles and guidelines, as amended, provide the criteria, procedures and arrangements for the establishment, review and audit of the provision of long-range identification and tracking information to SOLAS Contracting Governments, pursuant to the provisions of regulation V/19-1 and the *Revised performance standards and functional requirements for the long-range identification and tracking (LRIT) of ships* (resolution MSC.263(84), as amended).

3 The Committee agreed to keep the Principles and guidelines under review and to amend them as and when the circumstances so warrant.

4 SOLAS Contracting Governments are invited to bring the present Principles and guidelines to the attention of those engaged in the operation of LRIT Data Centres and the International LRIT Data Exchange.

5 SOLAS Contracting Governments and the LRIT Coordinator 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 Principles and guidelines, for consideration of any appropriate action.

6 This circular revokes MSC.1/Circ.1412/Rev.1 issued on 21 November 2014. Any reference to MSC.1/Circ.1412 or MSC.1/Circ.1412/Rev.1 should henceforth be read only as a reference to this circular.

ANNEX**PRINCIPLES AND GUIDELINES RELATING TO THE REVIEW AND AUDIT
OF THE PERFORMANCE OF LRIT DATA CENTRES AND
THE INTERNATIONAL LRIT DATA EXCHANGE¹****1 General**

The Maritime Safety Committee, pursuant to the provisions of SOLAS regulation² V/19-1.14 and subject to the relevant provisions of section 14 of the Revised performance standards,³ has determined the following in relation to the review and audit of the performance of LRIT Data Centres and the International LRIT Data Exchange.

2 Audit client⁴

The audit client is all Contracting Governments to the 1974 SOLAS Convention (Contracting Governments), acting through the Committee.

3 Auditor

The auditor is the LRIT Coordinator.

4 Auditee(s)

The auditees are all LRIT Data Centres (DCs) and the International LRIT Data Exchange (IDE).

5 Audit programme

The audit programme is a third-party audit conducted by the LRIT Coordinator annually.

6 Audit programme objectives

The objectives of the review and audit of the performance of DCs and of the IDE are:

- .1 to verify that the LRIT system operates in accordance with the provisions of SOLAS regulation V/19-1 and of the Revised performance standards, taking into account the related provisions of the Technical specifications for the LRIT system and any relevant decisions of the Committee;
- .2 to verify that Contracting Governments and search and rescue services receive only the LRIT information they have requested and are entitled to receive;

¹ Terms not otherwise defined in these Principles and guidelines should have the same meaning as attributed to them in chapters I and V of the 1974 SOLAS Convention and in the *Revised performance standards and functional requirements for the long-range identification and tracking of ships* (resolution MSC.263(84), as amended).

² *Regulation* means a regulation of the annex to the 1974 SOLAS Convention.

³ *Revised performance standards* means the *Revised performance standards and functional requirements for the long-range identification and tracking of ships* (resolution MSC.263(84), as amended).

⁴ All audit-related terms used in these Principles and guidelines have the same meaning as in ISO 19011:2018 on *Guidelines for auditing management systems*.

- .3 to verify that DCs operate in accordance with the provisions of SOLAS regulation V/19-1 and of the Revised performance standards, taking into account the related provisions of the Technical specifications for the LRIT system and any relevant decisions of the Committee;
- .4 to verify that the IDE operates in accordance with the provisions of SOLAS regulation V/19-1 and of the Revised performance standards, taking into account the related provisions of the Technical specifications for the LRIT system and any relevant decisions of the Committee;
- .5 to identify any need for initiating corrective and/or preventative actions in the LRIT system or in any of its components; and
- .6 to identify opportunities for improving the efficiency, effectiveness and security of the LRIT system or in any of its components.

7 Audit criteria

7.1 The main criteria are SOLAS regulation V/19-1 and the Revised performance standards.

7.2 The supplementary criteria are the Technical specifications for the LRIT system,⁵ guidance, guidelines and recommendations approved or adopted by the Committee in relation to the LRIT system; and instructions of the Committee to the LRIT Coordinator in connection with the review and audit of the performance of the auditees.

7.3 After each session of the Committee and when amendments to any of the audit criteria are agreed, the Secretariat should make the updated information available to the LRIT Coordinator and to all auditees on the IMO public website.

8 Audit scope

8.1 The scope of the audit is limited to matters relating to the operation of DCs and of IDE to the extent such matters can be reasonably and with confidence verified through the audit evidence.

8.2 Matters relating to the implementation of the provisions of SOLAS regulation V/19-1 and of the Revised performance standards by Contracting Governments are outside the scope of the audit and fall within the scope of the *Framework and procedures for the IMO Member State Audit Scheme* (resolution A.1067(28)).

8.3 Specifically all matters which would require the provision to the LRIT Coordinator of list(s) of ships which at any particular time are required to transmit LRIT information in accordance with the provisions of SOLAS regulation V/19-1.4.1 are outside the scope of the audit. For example, questions such as whether all such ships have in fact been integrated and are transmitting LRIT information or whether or how the provisions of SOLAS regulation V/19-1.7 are implemented.

8.4 Unless the Committee decides otherwise, the LRIT Coordinator is not required to audit the fee structure of DCs or of IDE.

⁵ Refer to MSC.1/Circ.1259, as revised, and MSC.1/Circ.1294, as revised, on LRIT system technical documentation (parts I and II, respectively).

9 Responsibilities

9.1 The LRIT Coordinator and the auditee should be well aware of the importance of the task they are about to perform and should act with care and professionalism when discharging their responsibilities related to the review and audit.

9.2 In this context, the LRIT Coordinator should:

- .1 conduct a fair, consistent, professional, independent and evidence-based audit;
- .2 discharge its responsibilities in relation to the audit in a timely manner;
- .3 cooperate and provide assistance to the auditee on any matters related to the audit;
- .4 establish communication with the auditee and provide the auditee with necessary information related to the audit;
- .5 make audit findings available to the auditee and seek contributions of the auditee within an established time frame;
- .6 prepare a complete, accurate, concise and clear record of the audit and make copies available to the auditee;
- .7 submit a report of the audit to the Secretary-General of IMO; and
- .8 make available copies of the completed audit reports to the NCSR Sub-Committee, for consideration.

9.3 On its part, the auditee will be expected to:

- .1 cooperate with the LRIT Coordinator and to discharge its responsibilities in relation to the audit in a timely manner;
- .2 conclude a contractual agreement with the LRIT Coordinator with respect to the legal, operational and financial commitments of the audit;
- .3 settle its financial obligations vis-à-vis the LRIT Coordinator in accordance with the agreement it has made with the LRIT Coordinator;
- .4 cooperate and make available to the LRIT Coordinator the information and audit evidence required to enable the satisfactory completion of an audit of its performance;
- .5 determine and propose corrective actions to address any significant audit findings; and
- .6 keep the LRIT Coordinator informed of the status of their non-conformities.

10 Audit evidence

10.1 The LRIT Coordinator should establish the details of the audit evidence it requires to be submitted for the review and audit of the performance of DCs and of IDE.

10.2 The audit evidence should, at least, consist of:

- .1 replies to questionnaire(s) developed by the LRIT Coordinator taking into account the audit objectives, criteria and scope;
- .2 samples of LRIT information and samples of LRIT messages, including related samples of journals, where such ones are required;
- .3 statistics compiled by DCs and IDE, as appropriate;
- .4 records of communications between the LRIT Coordinator and DCs and/or IDE;
- .5 data and information contained in the production environment of the LRIT Data Distribution Plan; and
- .6 data and information that may be obtained from search and rescue services.

10.3 The LRIT Coordinator should put in place the necessary arrangements to ensure that all audit evidence is protected from unauthorized access or disclosure as from the time such evidence is received by the LRIT Coordinator.

10.4 The LRIT Coordinator is not normally required to submit for the consideration of the NCSR Sub-Committee any of the audit evidence.

10.5 The LRIT Coordinator should keep the audit evidence relating to the review and audit of the performance of a DC or of the IDE for a period not exceeding five years as from the date of completion of the audit it referred to and afterwards should destroy this information, provided there are no outstanding or pending issues and that the NCSR Sub-Committee has reviewed and accepted its related report. The method for the destruction of the audit evidence remains at the discretion of the LRIT Coordinator.

10.6 All DCs are required to provide to the LRIT Coordinator at least one sample of LRIT information and LRIT messages which covers 30 consecutive calendar days (the 30-day sample) during the period which is to be covered by the audit. The LRIT Coordinator should determine, in consultation with the DC concerned, the first and last date to be covered by the samples. The DC and the LRIT Coordinator should endeavour to reach a mutual understanding on the dates to be covered by the sample in cases of any difference of opinion. If such consultations do not yield an agreed approach, then the decisions of the LRIT Coordinator shall prevail.

10.7 Taking into account the number of DCs subject to audit and review in a given calendar year, it is recognized that IDE may be required to provide to the LRIT Coordinator the journal(s) of all transactions for the whole calendar year. The LRIT Coordinator and IDE should consider and agree practical arrangements for the provision of the IDE Journals to the LRIT Coordinator for the purpose of review and audit of the performance of DC and of IDE. The LRIT Coordinator should provide relevant information to the NCSR Sub-Committee, as appropriate.

10.8 The LRIT Coordinator may, if deemed fit and appropriate, require the submission of further audit evidence as the circumstances may warrant.

10.9 The LRIT Coordinator should establish and make known to all DCs and to IDE the method(s) and format(s) to be used for providing the audit evidence and in particular the samples. The LRIT Coordinator should provide information to this end to the NCSR Sub-Committee.

10.10 Notwithstanding the related provisions of the Revised performance standards, the LRIT Coordinator should seek the provision of audit evidence from search and rescue services if it finds it fit and appropriate.

11 Audit plan and procedures

The LRIT Coordinator should develop the audit plans and procedures and should provide details of these to all DCs and IDE. The LRIT Coordinator should provide information to this end to the NCSR Sub-Committee.

12 Audit findings and corrective actions

12.1 The LRIT Coordinator should evaluate the audit evidence against the audit criteria and generate audit findings. Audit findings can indicate either conformity or non-conformity with the audit criteria. Additionally, some audit findings can lead to the identification of risks, opportunities for improvements or recording good practices.

12.2 The LRIT Coordinator should determine and grade all non-conformities as either major non-conformities, non-conformities or observations, as appropriate.

12.3 The DC concerned or IDE should, in consultation with the LRIT Coordinator, determine and propose the corrective action(s) and the period within which the non-conformities should be dealt with and closed. DCs and IDE should always keep the LRIT Coordinator informed of the status of their non-conformities. The completion and effectiveness of corrective actions should be verified by the LRIT Coordinator, normally at the next audit.

12.4 The LRIT Coordinator should, if it finds it appropriate, require the submission of further audit evidence or samples with a view to ascertaining that the agreed corrective action(s) have been implemented and the non-conformity has been dealt with and/or that any further non-conformities have not occurred. If the LRIT Coordinator does not see a compelling need to request submission of further audit evidence, the verification of the corrective actions should be undertaken at the next audit of the DC concerned or of IDE.

12.5 In case a DC or IDE is issued with a major non-conformity note or any identified non-conformity affects the continuity of the LRIT system, the LRIT Coordinator should inform, as soon as is practically possible, the members of the Operational governance body, as defined in MSC.1/Circ.1376, as revised, and should provide to them relevant details in order to enable them to determine the actions to be taken in accordance to the instructions of the Committee.

13 Audit date

13.1 Audit date should be considered as the date on which the LRIT Coordinator received the required audit evidence.

13.2 In this context, the LRIT Coordinator should, in consultation with the auditee, determine and confirm the audit date prior to audit. The auditee and the LRIT Coordinator should make every attempt to resolve any diverging opinions concerning the audit date. However, if an agreement cannot be reached, then the decisions of the LRIT Coordinator shall prevail.

14 Audit language

All correspondence, records, communications, audit evidence and audit plans and procedures should be in the English language.

15 Reporting

15.1 For each audit, the LRIT Coordinator should prepare a report providing a complete, accurate, concise and clear record of the audit. The audit report should include or refer to the following: the audit objectives; the audit criteria; the audit scope, particularly identification of the unit or processes audited and the time period covered; a list of the auditee representative(s); the dates when the audit activities were conducted; the audit findings, including information on non-conformities and their status; the audit conclusions; any uncertainties and/or obstacles encountered that could decrease the reliability of the audit conclusions; any areas not covered although within the scope of the audit; any unresolved diverging opinions between the LRIT Coordinator and the auditee; recommendations for improvement, if any; and agreed follow-up action plans, if any. Any statement of a confidential nature should be excluded from the audit report and communicated separately to the Secretary-General.

15.2 Prior to completion of the audit, the LRIT Coordinator should prepare and forward a draft audit report to the auditee for its perusal and comments, if any.

15.3 Any comments of the auditee should be submitted to the LRIT Coordinator within 15 days after the date of which the draft audit report has been sent to the auditee and, unless the LRIT Coordinator and the auditee agree otherwise, these should be included in the audit report.

15.4 The LRIT Coordinator and the auditee should endeavour to resolve any difference of opinion in relation to the contents of the audit report within five days after the date the auditee has submitted its comments. If the matter cannot be resolved, the comments of the auditee should be included in the audit report for consideration of the issue by the NCSR Sub-Committee.

15.5 The LRIT Coordinator should provide a copy of the audit report to the auditee concerned upon completion of the audit provided that the auditee has no other outstanding financial obligations against the LRIT Coordinator. The audit report should be in the English language.

15.6 The LRIT Coordinator should make audit reports available to the NCSR Sub-Committee in accordance with the arrangements to be agreed between the Organization and the LRIT Coordinator. The LRIT Coordinator should also provide information at each session of the NCSR Sub-Committee, in accordance with the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.1), on the audits that have been completed since the previous session of the Sub-Committee.

15.7 The audit reports should not be translated in the three working languages of the Organization and should be made available as documents containing information in the English language only.

15.8 The Secretary-General should protect the audit reports and any other communication of a confidential nature received from the LRIT Coordinator in relation to the audits of DCs and of IDE from unauthorized access or disclosure and should keep these for a period not

exceeding five years as from the date of completion of the audit they referred to and afterwards should destroy these, provided there are no outstanding or pending issues.

15.9 The Secretary-General should make available to the Committee or the NCSR Sub-Committee any communication of a confidential nature received from the LRIT Coordinator in relation to the audits of the DCs and of IDE, if requested, in the English language only.

16 Managing the review and audit dates of DCs and/or of IDE

16.1 The anniversary date of IDE is 15 October of each year.

16.2 The anniversary date of a DC is the date on which it became part of the production environment of the LRIT system after participating in the prototype testing phase or completing the integration testing phase, whichever applies.

16.3 In addition, the anniversary date of an existing DC may change in the way specified below if the DC concerned undergoes additional testing for any of the following reasons:

- .1 if a NDC is to start providing services to Contracting Government(s) other than that which established the centre – Anniversary date remains unchanged;
- .2 if a NDC is to become an RDC or a CDC – Anniversary date becomes the date on which the new testing was completed;
- .3 if a NDC that is already providing services to other Contracting Government(s), or a RDC or a CDC is to start providing services to Contracting Government(s) which was/were not included in previous testing – Anniversary date remains unchanged; and
- .4 if a Contracting Government is to become part of the establishment of an existing RDC or CDC – Anniversary date remains unchanged.

16.4 The review and audit of the performance of DCs and of IDE should be carried out within three months before or after the anniversary date, provided the period between two consecutive audits does not exceed 15 months. A DC or IDE may still be liable for review and audit of its performance even after it has ceased its operations provided that it had been operational in the production system at least six months since its first integration or anniversary date, whichever applies.

16.5 A DC may request the LRIT Coordinator to review and audit its performance on any date within three months before or after the anniversary date referred to in paragraph 16.2 or 16.3, provided the first audit is not held more than 15 months after the date referred to in paragraph 16.2. If the audit, upon request of the DC and subject to acceptance of the LRIT Coordinator, is carried out more than three months before the anniversary date, the new audit date should be considered thereafter as being the new anniversary date. The LRIT Coordinator should provide to the NCSR Sub-Committee information to this end as appropriate.

16.6 If the first audit of a DC cannot be carried out within 15 months after the date referred to in paragraph 16.2 or 16.3, or if the period between two consecutive audits exceeds 15 months, the DC concerned should remain liable to complete that audit at the earliest opportunity. This liability should accumulate until all outstanding annual audits have been completed. The LRIT Coordinator should provide to the NCSR Sub-Committee information to this end, as appropriate. The audit will additionally report on the reason(s) that led the DC to

be audited after the maximum 15-month period, and will recommend that the DC concerned takes all necessary measures to avoid the need to conduct further audits in the future which exceed the maximum 15-month period.

17 Technical issues

The appendix provides relevant information on a number of matters in connection with the review and audit of the performance of DCs and of IDE of a technical nature.

18 Audit programme review and monitoring

Contracting Governments acting through the Committee should monitor the implementation of the audit programme and, at appropriate intervals, should review it to assess whether its objectives have been met and identify opportunities for improvement or to initiate corrective or preventative actions.

APPENDIX

TECHNICAL MATTERS

1 The LRIT Coordinator is not expected to engage in any audit, verification or investigation as to the existence, accuracy or veracity of Notices of Arrival in connection with requests for the provision of LRIT information pursuant to the provisions of regulation V/19-1.8.1.2 and in this respect Notices of Arrival should be considered as being outside the scope of the review and audit.

2 In order to verify compliance with the provisions of paragraph 13.1 of the Revised performance standards, *TimeStamp1* and *TimeStamp4* of the LRIT position report message should be used. The time duration established by the difference between *TimeStamp1* and *TimeStamp4* of the LRIT position report message should be less than 15 min. Furthermore, the latency between the transmitting DC sending the LRIT information to the end user should be considered as being negligible (i.e. of the order of seconds).

3 In order to verify compliance with the provisions of paragraph 13.2 of the Revised performance standards, on-demand LRIT information should be considered as a poll request and the *TimeStamp* parameter of the LRIT position request and the *TimeStamp4* of the LRIT position report should be used. The time duration established by the difference between *TimeStamp* parameter of the LRIT position request and *TimeStamp4* of the LRIT position report message should be less than 30 min. Furthermore, the latency between the transmitting DC sending the report to the end user should be considered as being negligible (i.e. of the order of seconds). Additionally, if for any reason it is found necessary to use alternative sources to verify such compliance, the LRIT Coordinator should use the Rx and Tx *TimeStamps* contained in the IDE's journal for the LRIT position request and LRIT position report messages.

4 Each port, port facility or place under the jurisdiction of a Contracting Government should be considered as the centre of a circle and the distance indicated in the LRIT position request as corresponding with the radius of the circle. The difference on the calculation of the distances using different chart projections should be considered as being irrelevant, in terms of the precision required by the LRIT system as in most cases the ships are in motion when transmitting LRIT information.

5 When the entitlement of Contracting Governments to LRIT information is verified, it should be taken into account that different DCs and the LRIT Coordinator may utilize different GIS implementations, which may occasionally yield slightly different interpretations of where a ship is located in relation to DDP-defined polygons. This may result in occasional, legitimate technical differences between the LRIT Coordinator and the audited DC when determining which Contracting Governments are entitled to a particular ship position.

6 If DCs and the LRIT Coordinator use industry-standard GIS software applications, or custom-coded solutions that implement well-established computational geometric algorithms, the occurrence should be rare. The LRIT Coordinator may determine, on a case-by-case basis, if the differences between its own entitlement determinations and those of the audited DC are sufficient to warrant detailed analysis.

7 DCs should provide to the LRIT Coordinator all LRIT Messages with the exception of the file attachments associated with Message 10 (DDP Update), Message 12 (Journal) and Message Type 16 (Geographical area update). All LRIT messages are required to have a unique *Message Id*.

8 LRIT information that had not been provided to an external LRIT Data User within the 30-day sample should be classified as Message type 1 with Response type 2 when provided to the LRIT Coordinator. The *DDPVersionNum* parameter in these messages should refer to the *DDPVersionNum* that was used by the DC for entitlement verification. Furthermore, the *TimeStamp5*, *DataUserRequestor* and *PositionSent* parameters of these messages should be generated as follows:

- .1 *TimeStamp5* = "1000-01-01T00:00:00Z";
- .2 *DataUserRequestor* = "0003" (the LRIT ID of the LRIT Coordinator); and
- .3 *positionSent* = "false".

9 The IDE should provide its journal with the exception of the file attachments associated with Message 10 (DDP Update), Message 12 (Journal) and Message Type 16 (Geographical area update). The *Latitude*, *Longitude*, *TimeStamp1* and *ShipborneEquipmentId* parameters of the LRIT position reports should be generated as follows:

- .1 *Latitude* = "00.00.00.N";
- .2 *Longitude* = "000.00.00.W";
- .3 *TimeStamp1* = "1000-01-01T00:00:00Z"; and
- .4 *ShipborneEquipmentId* = "N/A".

10 All information contained in the audit files should be in XML and in the English language encoded in UTF-8.

11 DCs should provide to the LRIT Coordinator, upon request, a file *LRITMessageLog_<LRIT ID of the DC>.xml*, according to the format defined in the XML schemas.

12 The IDE should provide the LRIT Coordinator, upon request, a file *LRITMessageLog_<LRIT ID of the IDE>.xml*, according to the format defined in the XML schemas.
