



Australian Government

Australian Maritime Safety Authority

LONG RANGE IDENTIFICATION AND TRACKING

Guide to Requirements and Implementation



© Australian Maritime Safety Authority

This work is copyright. It may be reproduced in whole or part subject to the inclusion of an acknowledgement of the source and no commercial usage or sale.

Reproduction for purposes other than those indicated above requires the written permission of the Australian Maritime Safety Authority, GPO Box 2181, Canberra City ACT 2601.

CEO Foreword

The Australian Maritime Safety Authority is pleased to provide this guide as a high level overview of the requirements for Long Range Identification and Tracking. LRIT is a significant initiative by the International Maritime Organization to address the many issues presented by the need to respond to achieving maritime domain awareness - specifically the safety, security and environmental aspects. While LRIT can provide great benefit for security, the use for maritime safety and environmental protection has led IMO to include this in the 'safety' chapter of the Safety of Life at Sea Convention (Chapter V).



AMSA has already implemented LRIT, and recognises the technical challenges involved. At the same time, there are a number of policy issues that need to be addressed to realise the benefits of LRIT from a national, regional and international perspective.

I hope that you will find the information in this guide useful as you verify readiness for compliance with the SOLAS regulation. I encourage you to visit the AMSA LRIT web portal on our website - www.amsa.gov.au, as well as reviewing the many documents developed by IMO on LRIT.

Graham Peachey
Chief Executive Officer

List of acronyms and definitions

AIS	Automatic Identification System
AMSA	Australian Maritime Safety Authority
APR	Automatic Position Report
ASP	Application Service Provider
AusCDC	Australian Cooperative Data Centre
CDC	Cooperative Data Centre
CSP	Communications Service Provider
CTR	Conformance Test Report
DC	Data Centre
DDP	Data Distribution Plan
DSC	Digital Selective Calling
GISIS	Global Integrated Shipping Information System
GMDSS	Global Maritime Distress and Safety System
IDC	International Data Centre
IDE	International Data Exchange
IMO	International Maritime Organization
IMSO	International Mobile Satellite Organization
LRIT	Long-Range Identification and Tracking
MDA	Maritime Domain Awareness
MSC	Maritime Safety Committee (of the IMO)
NDC	National Data Centre
PSC	Port State Control
RCC	Rescue Coordination Centre
RDC	Regional Data Centre
SAR	Search And Rescue
SOLAS	International Convention for the Safety of Life at Sea, 1974

Introduction to LRIT

The International Maritime Organization (IMO) has adopted an amendment to Chapter V of the 1974 International Convention for the Safety of Life at Sea (SOLAS) that introduces new mandatory position reporting obligations for SOLAS ships.

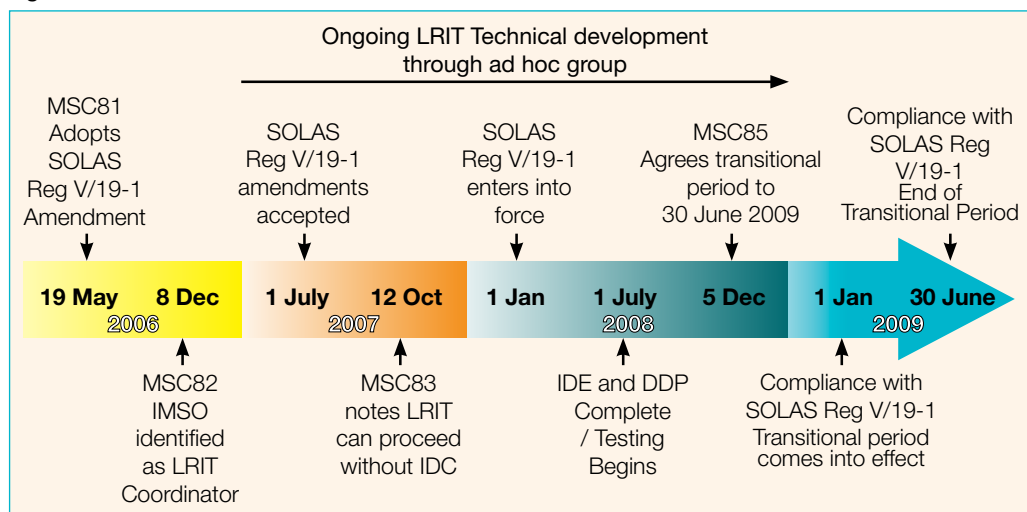
SOLAS Chapter V, Regulation 19-1, on Long Range Identification and Tracking (LRIT) refers to the requirement for specified Convention vessels to automatically transmit their identity, position and date/time of the position at 6-hourly intervals, with an ability to increase the rate to intervals of up to once every 15 minutes when requested. In addition, the equipment must be able to respond to poll requests. The LRIT system was designed in such a way as to limit direct cost to shipping or search and rescue (SAR) services, with IMO Member States bearing the cost of the system.

The SOLAS amendment came into effect 1 January 2008 with compliance originally mandated from 31 December 2008. In December 2008, at the 85th meeting of the IMO Maritime Safety Committee (MSC), transitional arrangements were agreed to cover the period between 31 December 2008 and 30 June 2009.

Australia is responding to the requirements of LRIT through the formation of the Australian Cooperative Data Centre (AusCDC) – an initiative to promote the timely implementation of LRIT in cooperation with other IMO Member States in the Asia-Pacific region.

This booklet has been prepared to provide some guidance to maritime authorities that are responsible for implementation of LRIT as stipulated by the SOLAS Convention. It has been developed to increase awareness of LRIT and promote compliance. The booklet provides an overview of the LRIT system, describes how the system works, and highlights the obligations for implementation of the LRIT amendments to SOLAS.

Figure 1



What is LRIT?

An overview of the operational concept of LRIT

LRIT is a maritime domain awareness (MDA) initiative to enhance maritime safety, security and protect the marine environment. LRIT allows Member States to receive position reports from vessels operating under their flag, vessels seeking entry to a port within their territory, or vessels operating in proximity to the State's coastline.

There are two aspects to LRIT:

1. The 'reporting' aspect where vessels to which LRIT applies report their identity and position, with a date/time stamp, every six hours (four times per day).
2. The 'receiving' aspect where coastal States can purchase reports when vessels are within 1,000 nautical miles, or where port States can purchase reports when vessels seek entry to a port at a pre-determined distance or time from that port (up to 96 hours pre-entry).

Put in simple terms, LRIT is a collection and distribution system for basic information on vessels, and applies to the following ships engaged on international voyages:

- ▶ All passenger ships including high speed craft;
- ▶ Cargo ships, including high speed craft of 300 gross tonnage and above; and
- ▶ Mobile offshore drilling units.

Ships operating exclusively in GMDSS Sea Area A1 and fitted with an Automatic Identification System (AIS) are exempt from LRIT requirements, while ships operating in Sea Areas A2, A3 and A4 are required to be fitted with a system to automatically transmit LRIT information in accordance with SOLAS Regulations¹.

Vessels limited to domestic voyages – for example coastal trading vessels that only travel between Australian ports, do not reflect the definition of 'International Voyage' and are not required to report to LRIT. However, if a vessel that normally does coastal trading proceeds to an international port for any reason, including dry dock, they will need to either fully comply with the LRIT requirements or apply for an exemption for the duration of the international voyage.

did you know -

LRIT is applicable only to specified vessels as identified in the SOLAS Convention – it does not apply to non-Convention vessels, like pleasure craft or fishing vessels.

¹Definitions of sea areas are provided in SOLAS, Chapter IV. Basically, sea area A1 is within marine voice VHF range of a VHF DSC coast station, sea area A2 is within marine voice MF range of a MF DSC coast station, sea area A3 is outside of A1 and A2 and in the coverage of Inmarsat geostationary satellites, and sea area A4 is what is left - normally polar regions above 70 degrees latitude.

How does LRIT work?

A request / response system

The LRIT system involves a request and response process, with various components linked together. Ship LRIT equipment must be capable of being configured to transmit information as an Automatic Position Report (APR). The APR includes the identity of the ship, the position of the ship and the date and time of the position report.

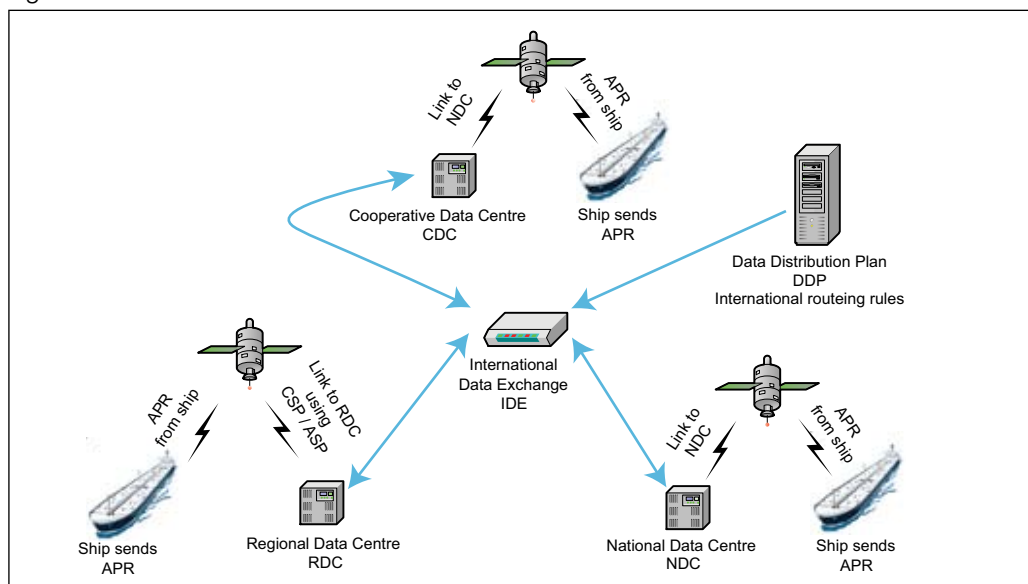
In addition, the equipment must be able to respond to poll requests for an on-demand position report and be able to immediately respond to instructions to modify the APR interval to a frequency of a maximum of one report every 15 minutes. The equipment requirement may be met through existing GMDSS Inmarsat equipment, or it may be necessary to install equipment designed to be LRIT compliant – testing has been designed to ensure whatever equipment is used will work within the overall LRIT system. Shipowners should be aware of the Application Service Provider (ASP) that their flag has recognised or authorised to undertake testing.

A system of systems

A simplified overview of the data flow in LRIT is shown in figure 2. This shows the process for linking the collection centres (data centres) operated by the Contracting Government to an exchange system known as the International Data Exchange (IDE).

The IMO has appointed the International Mobile Satellite Organization (IMSO) as LRIT Coordinator, who will undertake the audit and oversight functions for LRIT.

Figure 2



Implementation of LRIT requirements

The table below provides an overview of the technical and regulatory actions required in order to implement LRIT requirements.

Action required for LRIT implementation	Administration	Coastal State	Port State	Ship
Decide LRIT data centre (DC) for reporting / Identify ASP	X			
Identify point of contact for LRIT	X			
Verify own flag vessels to which LRIT applies and provide to DC	X			X
Identify recognised testing ASPs (optional)	X			
Communicate information to IMO / ongoing communication for integration testing	X			
Survey and certify LRIT equipment	X			X
Develop DDP input data – polygons, coastal and port state requirements	X	X	X	
Determine requirements for purchase of LRIT data	X	X	X	
Identify Port State Control (PSC) requirements and ship survey expectations	X		X	
Ensure confidentiality of LRIT information	X	X	X	

ment the LRIT amendments to SOLAS.

ASP	Comments
	Options include developing the data centre 'in-house', buying the services of a data centre, or joining an existing data centre.
	Critical for ongoing communication with IMO, including issuance of user name / password for DDP.
	As per SOLAS V 19-1, note definition of international voyage. May require to be developed in discussion with shipowners to verify / clarify voyage area.
	It may be appropriate to provide alternatives for shipowners to enable testing from more than one source.
X	The IMO has developed a model letter for communication. This is required to enable access to the DDP for data entry.
X	Need to verify the issuance of the conformance test report and link to amendment of own flag vessel ship safety certificates.
	Polygon development is critical to overall operation of the system. Verification of any existing port data is required to ensure appropriate response for Port State requests.
	From an overall administration point of view, and in conjunction with Coastal and Port State users, verify requirement for, and use of, LRIT data obtained through the system.
	Noting the link of LRIT to the ship safety certificate, ensure expectations clearly identified and promulgated. Ship Surveyors briefed in LRIT aspects as required.
	Noting the extent of data collected, verify use and distribution to ensure this reflects SOLAS V 19-1.

Setting the Rules

International Routeing Rules

Information transmitted by ships through automatic position reporting is available to the vessel's Flag State at all times. For another Flag State to access the information, they will send a request to the IDE. Linked to the IDE is the Data Distribution Plan (DDP) that will have the 'routeing rules' and this will verify that the 'requestor' can access the information. Each Contracting Government will provide these routeing rules to the IMO, which has developed the DDP. Data is entered into the DDP using the LRIT module of the Global Integrated Shipping Information System (GISIS).

The DDP ensures that LRIT data flows according to the wishes of a Contracting Government – i.e. providing information on vessels within 1,000 nautical miles for coastal State, or up to 96 hours out for port State.

If the DDP verifies that the information request is valid, the IDE will then act as a link to the Data Centre requesting the information and the Data Centre providing the information. The link between the satellite and a Data Centre will require the use of a Communications Service Provider (CSP) and Application Service Provider (ASP).

To ensure effective operation of the end-to-end system, IMO has identified a rigorous series of development and integration tests that include Data Centres, ASP, CSP, IDE and DDP.

did you know -

IMO will only provide access to the LRIT module in GISIS to the official contacts for LRIT, as provided by the Contracting Government.

Maritime Safety and Environmental Protection

The Regulation for LRIT indicates that Contracting Governments can receive the information for security and other purposes. IMO has specifically referenced safety and environmental protection, with detailed standards developed for the use of LRIT to assist in search and rescue operations.



The Cost of LRIT

The LRIT system was designed in such a way as to limit direct costs to shipping. However, there are costs to the system.

The cost to IMO Member States

Similar to your mobile system costs where you need to buy a phone, then find a service provider and finally pay for communications, the main cost for LRIT occurs at three points:

- ▶ The cost for the Data Centre;
- ▶ The cost for own flag ships to report to the system; and
- ▶ The cost for data requested through the system.

In addition there will be LRIT Coordinator costs associated with audit and oversight functions.

For LRIT data used by SAR there is no cost to the front line Rescue Coordination Centre (RCC) requesting the data. However, the cost for the communications and data transfer has to be covered somehow. It has been decided that these costs will be borne by the flag of the vessel from which data was requested, and will be part of the overhead of LRIT.

The cost to ship owners

Although minimized, there is a cost for ship owners in ensuring the equipment on board the vessel can respond to the LRIT requirements.

- ▶ Equipment - In some instances, existing equipment can be used for LRIT, while in others LRIT specific equipment may be required.
- ▶ Equipment Tests - To verify compliance, LRIT equipment tests have been developed. These tests have been designed to incorporate each element of LRIT, and successful completion results in the issuance of a Conformance Test Report (CTR).

did you know -

shipboard equipment must be tested before LRIT can be included in the ship safety certificate. The timing for the equipment test is linked to the first survey of the radio installation after 31 December 2008.

Implementing LRIT

Options

With the 'request/response' system, there is a need to ensure data is available within the system for when others request it – this means that Member States' flag vessels need to report to a Data Centre. There are different ways to respond to this Data Centre requirement:

1. Develop a National Data Centre in-house (NDC).
2. 'Buy in' the services of a commercial Data Centre provider as a National Data Centre (NDC).
3. Join with other Member States to form either a Regional Data Centre (RDC) or a Cooperative Data Centre (CDC).

The original concept of the LRIT system featured an International Data Centre (IDC) that would provide services to those Member States not using an NDC, CDC or RDC. At MSC83, the concept of an IDC was put on hold due to technical issues associated with setting up such a centre.

Member States are under no obligation to request LRIT data from other flag States. Accordingly, Member States may choose to provide LRIT data for their flagged vessels, to respond to their SOLAS obligations.

The benefit of the system will only be fully realised when data is requested through the system, and used by Contracting Governments for maritime domain awareness.

did you know -

IMO has an LRIT portal, accessed directly from www.imo.org

You can contact IMO using their dedicated LRIT e-mail address: lrit@imo.org

Issues

Implementing the complicated structure of the LRIT system requires a high level of technical coordination and detailed planning and testing. Some specific implementation issues include:

- ▶ Change of flag – Member States need to develop arrangements which ensure that vessels transferring their flag from one State to another remain integrated into the LRIT system and transmit LRIT information to the Data Centre of the appropriate Flag State.
- ▶ LRIT Polygon Development – In order for the LRIT system to function correctly, Member States need to submit geographical coordinates or vertices for 'polygons' which identify, at a technical level, the area in which a coastal State is entitled to request LRIT information.
- ▶ Communications standards – the draft technical standards for the LRIT communications systems will continue to evolve as more data centres move from the 'development' to 'production' environment.
- ▶ Process for Report Purchase – recognising the large number of agencies involved and the international aspect of the system, there is a need to ensure processes are in place to enable the sale and purchase of the LRIT data available in the system.

LRIT Implementation in Australia

Australia has participated in the discussion on LRIT throughout its development. To ensure early compliance, Australia put in place a commercial NDC solution with Pole Star Global (www.polestarglobal.com) to cover the initial set up of the system. Australian flagged vessels to which LRIT applies have been reporting to this NDC since February 2008.

Australia also plans to buy reports that it is entitled to, but is carefully following the cost implications. The value of the data is fully realised, but it must also be cost effective.

Australia has included reference to the LRIT SOLAS amendment in Marine Orders Part 21, and provides guidance on the implementation of LRIT through Marine Notices and the LRIT fact sheet available on AMSA's website (www.amsa.gov.au).

The Australian CDC

Australia has now opened its NDC to become a Cooperative Data Centre (AusCDC). This means that the existing commercial Data Centre can be expanded to provide other IMO Member States with an LRIT implementation option.

The benefits in joining a CDC include:

- ▶ Ease of implementation and responding to SOLAS obligations;
- ▶ Access to technical expertise;
- ▶ Use of a recognised ASP to achieve technical and administrative consistency;
- ▶ Sharing and building on experience;
- ▶ Fostering of dialogue on common maritime issues; and
- ▶ Capability enhancement.

The Cook Islands, New Zealand and Papua New Guinea have joined the AusCDC, and are already realising the benefits for the cooperative approach. Through regular teleconferences and communications, many of the 'growing pains' experienced in fulfilling the requirements for LRIT can be responded to.

A cooperative approach also benefits from a revised integrated testing program, to move members quickly from the development to the production environment of the system, while ensuring all requirements identified by IMO are fully met.

Making LRIT a reality

Implementing the LRIT system requires a high level of technical coordination and detailed planning and testing – both for shipborne equipment and for the end-to-end aspect of the system as a whole.

Timely implementation has the potential to significantly enhance international efforts to ensure maritime safety and security, and protect the marine environment. In addition, the statistical data that can be gained through analysis of international shipping could result in efficiency gains in the overall transport chain.



What needs to be done

A checklist for readiness for LRIT:

The implementation table on pages 6-7 highlights the main requirements for compliance with LRIT. There are many elements which need to be satisfied for Member States to meet their obligations for LRIT, including:

- Identify option for implementation
- Identify point of contact for LRIT
- Verify contract / development of Data Centre
- Identify ASP
- Communicate information to IMO
- Identify LRIT covered in any legislation, marine orders, etc.
- Communicate approach taken to own flag vessels
- Ensure own flag vessels go through equipment testing and obtain their Conformance Test Report
- Identify LRIT Coordinator Costs for Data Centre, including start up and on-costs
- Develop LRIT Polygons
- Obtain user name and password for LRIT area of GISIS
- Enter required data into the Data Distribution Plan (through GISIS)
- Clarify PSC approach to be used
- Identify intention to purchase reports / use of data
- Ensure process in place to charge for / pay for reports through the system

With the need to fully test and then integrate Data Centres from a development to a production environment, the logistical and technical aspects of complying can be significant...

If you can tick the boxes, you should be ready for LRIT!



Australian Maritime Safety Authority

GPO Box 2181

Canberra City ACT 2601

p 02 6279 5000

f 02 6279 5002

w www.amsa.gov.au