Understanding offshore container certification

When you work with offshore containers, it’s important to understand the rules

Companies involved with building, procuring or maintaining offshore containers should have a general understanding of the standards and certifications governing their use.

From ISO-style units to custom-made skid packages, offshore containers are unique in the world of shipping containers. Alongside the g rowth of the offshore oil and gas industry, the use of offshore containers also continues to grow and diversify.

With the introduction of ISO 10855:2018 there is a step change for regulations. A global ISO standard now covers type approval, new construction and in-service inspection of offshore containers and their associated offshore slingsets.

The goal of this guide is to educate and inform, to provide a general understanding of the background of offshore container regulations, certifications and standards in order to avoid common misconceptions. It should not be taken as a comprehensive or all-exhaustive document.

Key terms used in this guide

API 2CCU	Offshore container standard from the American Petroleum Institute (API), spearheaded by the American Energy Cargo Container Association (AECCA).
CSC	Convention for Safe Containers (adopted 1972). Developed by the IMO to institute uniform international safety regulations for the transport of marine freight containers.
DNVGL-ST-E271 (DNV 2.7-1)	A publicly available standard for certifying offshore containers produced by a privately-held company.
EN 12079	Standard for offshore containers in CEN member States (EU plus Turkey, Macedonia, Iceland, Norway, and Switzerland); also adopted as a global standard for several years. Now superseded by ISO 10855.
IMDG	International Maritime Dangerous Goods Code. Enacted by Safety of Life at Sea (SOLAS) regulations and adopted as law by 162 governments and entities.
IMO	International Maritime Organization. The IMO publishes the IMDG code, the CSC regulations and is the holder of the SOLAS convention.
IMO MSC/Circ. 860	Guidelines for offshore container approval issued in the supplement to the IMDG code, and taken as regulation by all adoptees of the IMDG.
ISO 10855	New international standard for offshore containers and offshore sling sets. Supersedes EN 12079.
LRQACCS	LRQA's Container Certification Scheme. It originated in 1968 as the Freight Container Certification Scheme. The Scheme covers the three main service areas of intermodal equipment and provides compliance to all major container standards as well as compliance with IMO MSC/Circ. 860.
MSC	Maritime Safety Committee, the highest technical body in the IMO.
SOLAS	Commonly known as "Safety of Life at Sea," SOLAS is an international convention or treaty adopted by 162 contracting States. It requires that flag States ensure their ships comply with minimum safety standards in construction, equipment and operation. SOLAS specifies several international codes as part of its requirements. The IMDG code is one of these.

What is the definition of an offshore container?

As defined by the International Maritime Organization, an offshore container is a portable unit, specially designed for repeated use in the transport of goods or equipment to, from or between fixed and/or floating offshore installations and ships.

Common types of offshore containers

Offshore freight containers

An offshore container built for the transport of goods, which can include general cargo containers, cargo baskets, bulk containers, special containers, boxes and gas cylinder racks.

Offshore portable tanks are also included in this category. These are used to transport dangerous goods used offshore, and must also meet the International Maritime Dangerous Goods code.

Offshore service containers

Custom-built containers for a specific task that are generally temporary. Examples include labs, workshops, power plants and control stations.

Mud and wasteskips

A container that holds waste or hydrocarbon-contaminated drilling mud and waste. This type of container can be open or closed.

Skids

Offshore containers that contain machinery are also commonly called “skids” in the offshore oil and gas community, as they are often used to transport large mechanical components to drilling and production rigs.

Skids can be as simple as frames that hold the contents. Sometimes a skid and its contents is referred to as a “skid package.”

Offshore containers vs. ISO containers: What's the difference?

Offshore containers evolved from the common intermodal or ISO shipping containers.

"Intermodal" refers to the ability to move the container by different methods without having to unload it at each transfer (ship to rail to truck, for example).

The intermodal came into use in the 1950's and changed the world of commerce by providing a standard, low-cost method to transport goods internationally. The International Standards Organisation published ISO standards for containers between 1968 and 1970, cementing the role of the shipping container in the global economy.

The IMO also studied the safety of containerisation in marine transport and in 1972 the International Convention for Safe Containers (CSC) was adopted.

There are, in general, three factors that separate offshore containers from ISO containers:

Exposure to harsh environments

Offshore containers are often left exposed to open seas on the decks of supply vessels, and also loaded to platforms in harsh weather conditions, this also means that the minimum design temperature is normally specified as -20° C and the primary structure requires material of sufficient toughness for -20° C.

Loading and unloading forces

Because many offshore containers cannot be used with typical lifting equipment such as spreader beams, the methods of loading and unloading put different types of pressure on the structures of offshore containers. Offshore containers are supplied with a permanently installed sling set. Most do not have corner castings, and if they do, they are not allowed to be lifted from them.

Non-standard designs

Most offshore containers are built to fit a specific piece of equipment, and as a result do not fit into the categories of ISO containers.

Regulations vs. standards

There is some confusion in the offshore container industry when it comes to design and inspection standards for offshore containers versus what is required under international regulations.

The origins of offshore container regulations and standards lie in the Safety of Life at Sea Convention, or SOLAS treaty. SOLAS was created in 1914 as a reaction to the Titanic disaster. Thirteen countries attended the initial conference, but World War I prevented it from going into force.

International agreement and adoption of SOLAS became the first major project of the International Maritime Organization (IMO) when it first convened in 1958 as the Inter-Governmental Maritime Consultative Organization. It was then, as it is now, a specialised agency of the United Nations devoted to the safety and security of ships and the prevention of sea pollution. SOLAS went into force in 1965.

It was revised in 1974 to simplify the process for amending the treaty. The treaty also included a "tacit acceptance" procedure where amendments will be automatically entered into force unless member nations file objections.

SOLAS calls for all ships flagged by its member states to comply with minimum safety standards in construction, equipment and operation of merchant ships. Amendments have expanded its scope over the years to include provisions for nuclear ships, high-speed craft and stowage of cargo. The SOLAS convention is now held as law by 162 member States (see Annex B and Annex C). Those member states represent 99% gross tonnage of the world's merchant fleet.

SOLAS contains references to other codes that supplement the convention and are also held as law, such as the International Safety Management (ISM) code, or the International Life-Saving Appliance (LSA) code.

IMDG Code Adopted

In 1960, the SOLAS Conference contained a recommendation that member governments should adopt some set of regulations around the movement of dangerous goods and hazardous materials. The IMO's Maritime Safety Committee (MSC), the highest technical committee in the IMO, took four years to develop the International Maritime Dangerous Goods (IMDG) code. It was adopted in 1965. As of January 2004, all SOLAS member States must also follow IMDG.

The IMDG contains much more than guidelines for mariners. It applies to all companies and organisations connected to shipping.

The IMDG code is updated every two years, but amendments that don't affect the principles of the code can be adopted by the MSC and issued as supplemental circulars. This allows the IMO to respond to transport developments in a shorter time frame.

The IMDG code addresses the special nature of offshore containers and portable tanks handled in open seas. In Sections 12 and 13 of its introduction, the IMDG recognises that these are different from conventional containers. However, inspections of all containers are governed by the other international treaty, the Convention for Safe Containers.

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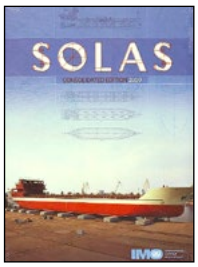


IMO MSC/Circ. 860: What is it?

As part of an effort to harmonise the implementation of the IMDG and CSC, the IMO developed MSC/Circ. 860. "Guidelines for the approval of containers handled in open seas."

As is the case with many regulations, IMO MSC/Circ. 860 does not contain detailed technical requirements. Instead, it is a guideline for how "approving competent authorities" should base their approval of offshore containers.

The circular states that both design calculations and testing should be taken into account when approving an offshore container. It specifies six points to consider on the design of the containers, as well as three tests that should be done at a minimum (4-point, 2-point and drop test).

To help approving authorities, it references four standards:

- EN 12079 (now withdrawn)
- DNV 2.7-1
- DNV 2.7-2
- BS 7072 (now withdrawn)

It is important to note that the circular does not mandate that approved competent authorities certify to these standards. Instead of making one standard compulsory, the circular allows all the standards to be used in the course of the approval and that they "should be consulted as appropriate."

The standards are ways manufacturers can meet the regulations, but they are not regulations themselves.

ISO standard for offshore containers

Work began on an ISO standard for offshore containers in 2008; the standard was published in 2018. A committee comprised of industry specialists and authorised competent authorities like LRQA have worked jointly to shape the standard.

Parts one and two of the standard focus on the requirements for new containers and sling sets. Part three addresses periodic inspection.

As per the introduction of this standard, "ISO 10855 (all parts) meets the requirements of IMO MSC/Circ. 860 (1998)."

Similarly, the introduction also states that ISO 10855 supersedes EN 12079-1:2006, which is now withdrawn.

It is not known when or if the text of IMO MSC/Circ. 860 will be updated to reflect ISO 10855.

Regulations and supporting standards

This flowchart shows how regulations relate to s tandards and circulars in the world of the International Maritime Organization.

SOLAS is the international treaty under which we find the regulations governing the approval of offshore containers, MSC/Circ. 860. The standards are used to help meet the stipulations of the circular, and are not regulations in and of themselves.

Who can approve and certify offshore containers?

As mentioned, the International Convention on the Safety of Containers governs the inspection of containers. In that international treaty, each member State names “approved competent authorities” to inspect and approve ISO containers and offshore containers.

LRQACCS is one of these approved competent authorities, and is one of the five specially referenced classification societies specified as a “certifying authority” or “authorised organisation” for a number of countries globally.

LRQA Container Certification Scheme - LRQACCS

The LRQA Container Certification Scheme (LRQACCS) has been used to certify containers of all kinds and has evolved to become the benchmark for technical container inspection procedures.

The goal of the LRQACCS is to present container design, inspection, and certification requirements in a clear and concise set of rules for both LRQA and its clients.

It covers the three main types of intermodal equipment for both new construction and in-service inspection:

- CSC/ISO/Intermodal Containers
- Offshore containers and equipment
- Tanks for the transport of dangerous goods

Through the LRQACCS, we provide assurance that equipment is inspected according to the required procedures and rules, and is safe and certified correctly.

What's the process for certifying offshore containers?

For type approval and certification, there are three basic steps:

1. **Appraisal and approval of the container's design**
2. **Survey during the manufacturing of the container**
3. **Testing of the prototype**

Design appraisal 1

The container's structural drawings are reviewed according to the standards referenced in IMO MSC/Circ. 860. Details of the materials and strength of the cargo containment structure, as well as the lifting and securing arrangements are appraised.

Drawings must show:

- Dimensions and load ratings
- Material specifications
- Details of welding methods and weld sizes
- Details of any other fastening methods
- Details of any special treatment for materials
- Details of sealant materials
- Details of corner fittings and closure mechanisms, together with name(s) of the manufacturer(s) of these parts
- Mandatory marking

Survey 2

A qualified surveyor inspects the process to meet code requirements.

Inspection programmes include:

- Verification and testing of materials
- Welder qualification
- Acceptance of weld procedures
- Acceptance of NDE procedures
- Witness and acceptance of prototype testing
- Verification of identification and marking

LRQA can also provide enhanced inspection to include client requirements for which the level of inspection can be determined by a "Competent Manufacturer" audit of the manufacturer.

Testing 3

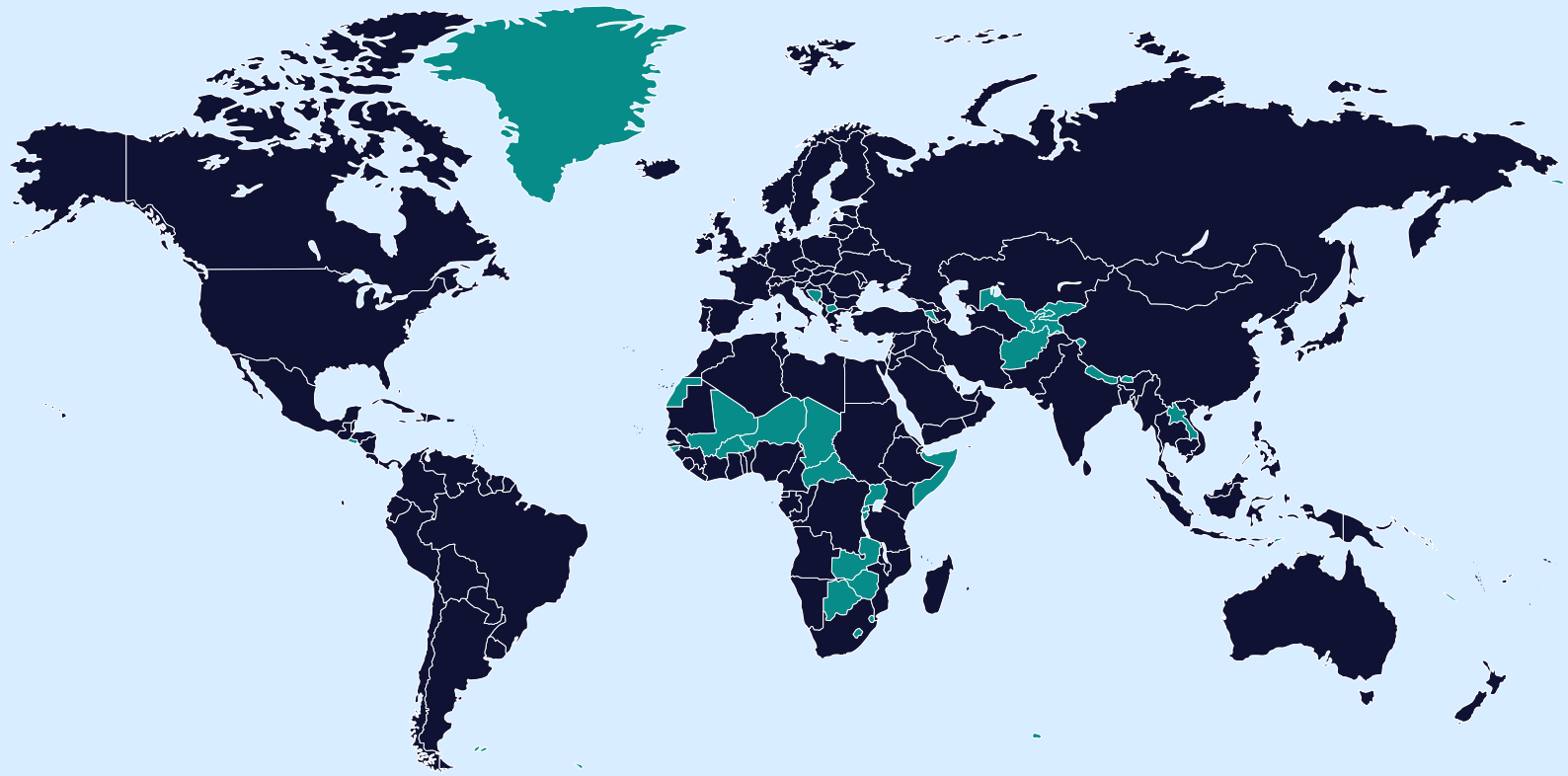
Type approval of a container involves the construction and testing of a prototype built according to the approved drawings. Testing must also use the same materials as proposed for normal production.

Tests include:

- Four-point lift using all padeyes
- Two-point lift test using opposed padeyes
- A vertical impact test
- A tilt test (if required by calculation)
- Tanks for dangerous cargoes are all tested according to the requirements of the IMDG Code.

Where is IMO MSC/Circ. 860 in force?

More than 160 countries have signed the Safety of Life at Sea Convention of 1974, putting MSC/Circ. 860 in force in the countries in blue.



+160 countries

List of contracting states to SOLAS (1974)

Albania
Algeria
Angola
Antigua & Barbuda
Argentina
Australia
Austria
Azerbaijan
Bahamas
Bahrain
Bangladesh
Barbados
Belarus
Belgium
Belize
Benin
Bolivia
Brazil
Brunei Darussalam
Bulgaria
Cambodia
Cameroon
Canada
Cape Verde
Chile
China
Colombia
Comoros
Congo
Cook Islands
Costa Rica
Cote d'Ivoire
Croatia
Cuba
Cyprus
Czech Republic
Dem. People's Rep. Korea
Dem. Rep. of the Congo
Denmark
Djibouti
Dominica
Dominican Republic
Ecuador
Egypt
Equatorial Guinea
Eritrea
Estonia
Ethiopia
Fiji
Finland
France
Gabon
Gambia
Georgia
Germany
Ghana
Greece
Grenada
Guatemala
Guinea
Guyana
Haiti
Honduras
Hungary
Iceland
India
Indonesia
Iran (Islamic Republic of)
Iraq
Ireland
Israel
Italy
Jamaica
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Jordan
Kazakhstan
Kenya
Kiribati
Kuwait
Latvia
Lebanon
Liberia
Libya
Lithuania
Luxembourg
Madagascar
Malawi
Malaysia
Maldives
Malta
Marshall Islands
Mauritania
Mauritius
Mexico
Monaco
Mongolia
Montenegro
Morocco
Mozambique
Myanmar
Namibia
Netherlands
New Zealand
Nicaragua
Nigeria
Niue
Norway
Oman
Pakistan
Palau
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Portugal
Qatar
Republic of Korea
Republic of Moldova
Romania
Russian Federation
Saint Kitts and Nevis
Saint Lucia
St. Vincent & Grenadines
Samoa
Sao Tome & Principe
Saudi Arabia
Senegal
Serbia
Seychelles
Sierra Leone
Singapore
Slovakia
Slovenia
Solomon Islands
South Africa
Spain
Sri Lanka
Sudan
Suriname
Sweden
Switzerland
Syrian Arab Republic
Thailand
Togo
Tonga
Trinidad & Tobago
Tunisia
Turkey
Turkmenistan
Tuvalu
Ukraine
United Arab Emirates
United Kingdom
United Rep. of Tanzania
United States
Uruguay
Vanuatu
Venezuela
Vietnam
Yemen
Hong Kong, China

How we can help: container services that go beyond what's required

LRQA has been involved in creating standards for container construction. Today, millions of containers around the globe carry the LRQA Container Certification Scheme approval mark, which shows they meet the correct standards and regulations.

From design to manufacturing, and inspection to certification, we keep containers moving, no matter where they're going or what they're carrying.

Full-service container solutions

- Design review and appraisal
  Internationally recognised and accepted certificates
- Container type approval
- Technical advice
- Owner acceptance
- In-service (periodic) inspection and certification

What we inspect

- New-build units
- Modified containers
- Re-manufactured/refurbished units

Key benefits of certifying your offshore containers through LRQA

Local design appraisals

Our design appraisal team spans the globe. It is comprised of local experts situated in key offices around the world who provide quality design appraisal services and quick turnaround.

Global reach

We offer local services around the globe and a consistent approach to inspection. Our surveyors have extensive experience with all the major offshore container manufacturers in Asia and around the world.

YOUR FUTURE. OUR FOCUS.

About LRQA:

By bringing together unrivalled expertise in certification, customised assurance, cybersecurity, inspection and training, we've become a leading global assurance provider.

We're proud of our heritage, but it's who we are today that really matters, because that's what shapes how we partner with our clients tomorrow. By combining strong values, decades of experience in risk management and mitigation and a keen focus on the future, we're here to support our clients as they build safer, more secure, more sustainable businesses.

From independent third-party auditing, certification and training; to technical advisory services; to real-time assurance technology; to data-driven supply chain transformation, our innovative end-to-end solutions help our clients negotiate a rapidly changing risk landscape – making sure they're shaping their own future, rather than letting it shape them.

Get in touch

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