



Container certification quality scheme

Part III. Guidance for certification of Offshore containers

CLIENT INFORMATION NOTE

Foreword.

At LRQA we are a Certifying Authority. The goal is to perform 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:

1. **CSC/ISO/Intermodal Containers.**
2. **Offshore containers and equipment.**
3. **Tanks for the transport of dangerous goods.**

General

The LRQA Container certification Quality Scheme is published over four individual procedures.

- | | |
|---------------------|---------------------------------------------------------------------------------------------|
| CQS Part I | General Guidance. |
| CQS Part II | CSC/ISO/Intermodal Containers, (Part A: New Manufacture & Part B: In-service). |
| CQS Part III | Offshore containers and equipment, (Part A: New Manufacture & Part B: In-service). |
| CQS Part IV | Tanks for the transport of dangerous goods, (Part A: New Manufacture & Part B: In-service). |

Contents

PART A: NEW BUILD OFFSHORE CONTAINER

1.	Introduction	_____
2.	Responsibility	_____
3.	Design Appraisal and Type Approval	_____
4.	Type Approval	_____
5.	Factory Quality Management System	_____
6.	Prototype Testing of the Offshore Container	_____
7.	Tilt Test	_____
8.	Weathertightness Test	_____
9.	Cargo Securing Points	_____
10.	Forklift Pocket Test	_____
11.	Driving Ramps	_____
12.	Production Inspection & Testing of the offshore container	_____
13.	Reporting, Certification & Marking	_____

PART B: IN-SERVICE OFFSHORE CONTAINER

	Introduction	_____
1.	In-service inspection	_____
2.	(Annual) Intermediate inspection	_____
3.	(Four yearly) Periodic inspection	_____
4.	Frame & weld inspection	_____
5.	Examination of wire rope sling sets	_____
6.	Damaged upper and lower terminals	_____
7.	Damaged rope terminations	_____
8.	Broken wires	_____
9.	Examination of chain rope sling sets	_____
10.	NDE of the container frame	_____
11.	Load test of the listing set	_____
12.	Exceptional inspections - repairs and modifications	_____
13.	Marking and stamping	_____
14.	Reporting	_____

Part A: New Build Offshore Containers

1. Introduction

The LRQA Container Certification Quality Scheme, (LRQA CQS), encompasses the certification of transportable CSC/ISO/Intermodal containers, Offshore containers and tanks for the transport of dangerous goods when constructed or inspected in-service at manufacturer's works on an individual basis or on a quality assured series production line basis. The CQS also includes requirements for in-service inspection of Containers, portable tanks, and tank vehicles.

The scope of this procedure LRQA CQS Part III is the certification of New Build & In-Service Offshore Containers and equipment.

Part A: New Build Offshore Containers & Equipment.

Part B: In-Service Inspection of Offshore Containers.

LRQA does not certify offshore equipment in accordance with product standards, but in accordance with the regulations, specifically IMO MSC/ Circ. 860 (1998).

2. Responsibility

The primary responsibility for equipment meeting regulatory requirements is with the Manufacturer and their QC department for new construction equipment and the owner/operator when the equipment is in-service.

Equipment shall not be presented to LRQA, which is knowingly non-compliant with regulations unless the non-conformity is advised prior to survey.

LRQA as Inspection Body shall undertake the inspection and certification of equipment covered by the procedure under the ISO 17020 accreditation for LRQA.

3. Design Appraisal

The manufacturer shall submit the technical file for design review, together with the list of approvals sought and what testing is required to meet the regulations. These details are to be reviewed by an authorised LRQA design surveyor to verify that the container will comply with the requested regulations. On completion of a design review a Design Approval Document (DAD) is issued. The DAD shall

define which prototype testing is required in accordance with section 6 of this document.

The materials shall be suitable for the type of cargo being carried, including an allowance for corrosion if appropriate.

The design appraisal shall consider the risk of protruding parts, which can contribute to bulwark snagging.

4. Type Approval

Offshore Containers are required to have a "Type Approval". Type Approvals are valid for 10 years unless there are significant changes to the regulations and/or standards, in which case a type approval may need to be revalidated with partial or full prototype testing as specified in section 6.

The type approval process requires the manufacturer to design and prototype test a container.

Type approvals are specific to a manufacturer and its location. Where a manufacturer requests to transfer original, valid LRQA offshore approvals to a new facility, the requirements shall be met:

- The client submits technical documentation and details of container(s), together with the list of approvals sought.
- The type approval submission should be in line with the submission requirements of LRQA CQS.

In cases where a manufacturer undergoes a relocation or intends to transfer approvals to another facility while retaining the same Quality Management System (QMS), it may not always be requisite to re-prototype test their containers. Instead, it is advisable for the manufacturer to promptly notify LRQA as the Inspection Body. LRQA will conduct an assessment to determine the appropriate actions and ensure compliance with technical standards and regulations.

5. Factory Quality Management System

The manufacturer's QC department shall demonstrate that they operate a recognised Quality Management System which can be followed to assure that the quality of the production units is

comparable to that of the prototype. As a minimum the manufacturers QMS should be as per ISO 9001 or equivalent (it is not a requirement to be certified to ISO 9001). It is recommended that this is documented in line with the LRQA Competent Manufacture Scheme to ensure they have the competence to present containers for certification in line with Offshore requirements, however as a minimum a quality system shall be audited and maintained.

6. Prototype Testing of the Offshore Container

The tests specified below are required to be undertaken. The tests are specified for ISO 10855-1. Test loads for prototype testing shall be specified on the LRQA DAD.

Where prototype testing is not to be undertaken the client shall fill in LRQA Form 2556 which compares the production unit to the prototype unit, for the LRQA design surveyor to verify that a previous prototype test covers the requirement for the current unit/batch.

On completion of the DAD, successful prototype testing and inspection of the prototype, a batch type approval certificate shall be issued.

Test No. From ISO 10855-1	Description	Internal load	Internal load
7.3.2	Lifting using all the pad eyes	2,5R	–
7.3.3	Lifting using two diagonally opposed pad eyes Vertical impact test	1,5R	–
7.4		R	–
Additional tests			
7.5	<p>Tanks for dangerous cargo shall in addition be tested according to the requirements of the IMDG code.</p> <p>When required other tests shall be carried out for containers of unusual configuration. These shall be agreed in advance with the certifying body.</p> <p>LRQA Requirement:</p> <p>Weathertightness- If appropriate, see Test No. 15 of LRQA's Prototype Test Report – ISO Series 1 Containers (Form FC3).</p> <p>Cargo Securing devices- If fitted, see Test No. 25 of LRQA's Prototype Test Report – ISO Series 1 Containers (Form FC3).</p> <p>Forklift pockets (1.6R) if fitted, see Test No. 5 of LRQA's Prototype Test Report – ISO Series 1 Containers (Form FC3).</p> <p>Driver Ramps- Record details in additional notes on Form 5210, per the requirements of ISO 10855-1: 5.4.4</p>		
<p>NOTE: The method and acceptance criteria of these tests may differ from similar tests set out in LRQA's Prototype Test Report – ISO Series 1 Containers (Form FC3). ISO 10855-1 should be consulted as applicable. Calibration of equipment shall conform to IMS03-04-67 and ISO 10855-1: 7.2.2</p>			

NOTE: The above table is for containers using ISO 10855-1 (e.g. where R>25000kg) refer to the DAD for lists of tests. Tests shall be carried out using currently calibrated measuring equipment, traceable to National/International Standards.

6.1 4-Point / All point lift test

The container shall be lifted by a suitable lifting set at an angle equal to the design angle. All parts of the container shall be clear of the ground throughout the test. The test shall be held for 5 minutes before measurements are taken. Care should be taken when measuring the deflection to ensure it can be undertaken safely.

Note: It is recommended that a string line is connected from each end point of the container with a chalk line to show the maximum allowable permitted deflection during test marked centrally.

The container shall be loaded to a total gross mass of 2.5 R and lifted clear of the ground, using all the pad eyes, (The test load may be obtained by putting in an internal test mass of 2.5 (R-T).)

The test masses shall normally be evenly distributed inside the prototype.

If it is not possible to place all the test mass inside the offshore container, some of it may be placed outside or under, providing this gives a loading on the structure similar to the distribution on the offshore container loading.

No deflections during testing shall be greater than 1/300 of the span of the member.

The offshore container shall show no permanent deformation or other damage after testing. MPI and visual inspection shall be undertaken after testing. Additionally, it is recommended that the manufacturer performs MPI on the frame before testing to ensure that there are no defects prior to testing.

6.2 2-Point lift test

An offshore container fitted with four pad eyes shall also be lifted from only two pad eyes, situated diagonally from each other, with a total mass of 1.5 R. This can be achieved by putting in an internal test mass of 1.5 (R - T).

After the test there shall be no significant permanent deformation or other damage. Significant permanent deformation shall be considered above 8mm.

The offshore container shall be subject to MPI and visual inspection after testing.

Note: It is recommended that a string line is connected from each end point of the container with a chalk line to show the maximum allowable permitted deflection during test marked centrally.

6.3 Drop / Impact test

The container shall be lowered or dropped on to a workshop floor of concrete or other rigid structure. This floor may be covered with a sheathing of wooden planks with a thickness not exceeding 50 mm.

The container shall be inclined so that each of the bottom side and end rails connected to the lowest corner forms an angle of not less than 5° with the floor.

The impacting corner shall be the one expected to have the lowest rigidity. For closed dry cargo containers this will normally be at the door end.

No significant permanent damage shall occur.

Cracks in welds and minor deformations may be repaired.

One of the following procedures shall be carried out:

a) Drop test

An internal load equal to payload (P) shall be safely secured and the container shall be inclined as described above.

The container shall be suspended from a quick release hook. When released, the container shall drop freely for at least 50 mm to give it a speed at initial impact of at least 1 m/s.

b) Lowering test

An internal load equal to payload (P) shall be safely secured and the container shall be inclined as described above.

The container shall be lowered to the floor at a constant speed of not less than 1.5 m/s.

c) Pull-Out Drop Test

An internal load equal to payload (P) shall be safely secured and the container shall be inclined as described above.

A removable support (minimum length of which shall be 450 mm) shall be centrally located at the front of the unit.

A wire rope or chain shall be secured to the support to assist in pulling the support out.

A forklift truck of sufficient capacity to pull the support bar cleanly out, shall be connected to the loose end of the wire rope/ chain.

Under one front corner a pack of Steel between 25 mm and 50 mm thick shall be placed in such a position that when dropped the unit shall impact on that pack first.

The unit shall be lowered until the rear corner posts are touching the ground and the front is supported by the removable support.

The container, suspended from the crane, shall be lowered until no weight is being supported by the crane.

The support is to be pulled cleanly out from under the container to give it a speed at initial impact of at least 1 m/s.

NOTE: Drop test (Option A) and Lowering test (option B) take priority, Pull-out drop test (Option C) can only be considered with pre-authorization from LRQA. It is recommended that the test is recorded so that the initial impact speed can be verified.

7. Tilt Test

Offshore Supply Ships operate in wave heights up to 6m, which relates to an angle of 30° for the offshore container. For the safety of the operators the offshore container shall be designed to withstand tilting at 30° in any direction without overturning (tipping) when loaded at their maximum gross mass. In empty condition or any intermediate condition, and with the centre of gravity considered to be the half height of the container. Refer to ISO 10855-1: Section 5.1.2. For dedicated purpose containers (e.g. bottle racks and tank containers) the actual centre of gravity shall be used.

Where the calculation cannot verify the adequacy of the container to resist the designated tilt angle a tilt test shall be undertaken on the prototype container.

For the tilt angle test the offshore container shall be tested both empty and full to ensure its adequacy to resist overturning at sea.

Safety precautions shall be undertaken to ensure that the container on test cannot topple beyond a safe limit, e.g., by connecting ropes to the corner castings.

The LRQA surveyor shall ensure that the correct angle is used for the test, and that the test container is tested both empty and full. The results shall be recorded.

8. Weathertightness Test

When specifically required, the Weathertightness test shall comply with the following.

A jet of water is to be applied to all exterior surfaces, joints, and seams of the container from a nozzle of 12.5 mm inside diameter, at a pressure of 1.0 bar, being held at a distance of 1.5 metres from the container being tested. The speed of movement over the container does not exceed 100 mm/s. The duration of this test is to be not less than fifteen minutes.

No evidence of water leakage within the interior of the container shall be found.

NOTE: All cargo containers required to be weathertight, except tank containers, are to undergo this test. If alternative methods of testing for weathertightness are proposed, they must be approved by LRQA. This test is to be performed on the same container that has undergone the Transverse racking test - door end. It may be a requirement of production that all containers are tested in this way.

9. Cargo Securing Points

When required, the cargo securing points shall be tested. Cargo hanging rails are to be tested to 1.5 times the rated load.

The method of carrying out this test is to hang the required test load uniformly over the length of the rail for a period of at least five minutes. All observations shall be noted.

There should be no permanent damage to the hanging rail and its attachments. Containers for general cargo shall have internal securing lashing points as detailed in section 5.4.5 of ISO 10855-1, each lashing point shall be tested to a load of 10 KN without damage to either the lashing lug or the frame to which it is connected. It is recommended that there are a minimum of 12 lashing points and that they are foldable.

10. Forklift Pocket Test

When required, the forklift pocket test shall comply with the following;

The container is to be placed on four level supports on the same plane, one under each corner fitting, with the base structure free to deflect.

The load (1.25R-T, noted 1.6R-T for ISO) is to be uniformly distributed over the floor of the container.

The container is to be supported on two horizontal bars, each 200 mm wide, projecting 1828 mm into the forklift pockets, measured from the outer face of the side of the container. The bars are to be placed centrally in the pockets.

The minimum dimensions of the forklift pockets shall be 200mm x 90mm, the forklift pockets shall be located as far as practicable but need not be more than 2050mm apart from the centre of pocket to centre of pocket.

The container is to be lifted to a position clear of all obstructions, held in this position for not less than five minutes, and then lowered to its original position. Severe deflections or deformations are to be noted.

11. Driving Ramps

When required, the driving ramp test takes the form of a floor test. However, the test load on the axle shall be 1.25P, up to a maximum of 7260kg.

If a container is specially designed to transport one or more-unit cargoes with a weight (UC) that would give a higher axle load, the test load shall be 2 UC.

Driving ramps are to be clearly marked with the maximum allowable axle load, which shall be 0,8× the test load.

The container is to be placed on four level supports in the same plane, one under each corner fitting, with the base structure free to deflect.

A vehicle with a front axle weight of 5460 kg (see note below) is to be maneuvered over the entire floor area in a longitudinal direction. One pass is to be made along each side with the front wheels of the vehicle as close to the side wall as practicable.

Each front wheel of the vehicle should weigh 2730 kg and have a contact area of 142 cm². The wheels are to be 180 mm wide and are to have a centre-to-centre dimension of 760 mm. The width of the test load is limited to the overall width of the wheels.

NOTE: From ISO 1496-1, vehicle weight has been changed to 7260 kg (i.e. 3630 kg on each of two wheels). If the container is to be certified as being tested with a higher vehicle weight, i.e. 7260 kg, the total axle weight must not be less than that figure and the contact area must not be larger than that stated above.

12. Production Inspection & Testing of the offshore container

Production shall be performed in accordance with LRQA approved drawings, specifications, and procedures. All production documents conforming to this document shall be prepared and

approved by LRQA before production starts.

The manufacturer shall ensure that the quality of the procedures and facilities used through operation of a quality management system such as ISO 9001 or equivalent to.

12.1 Material certification

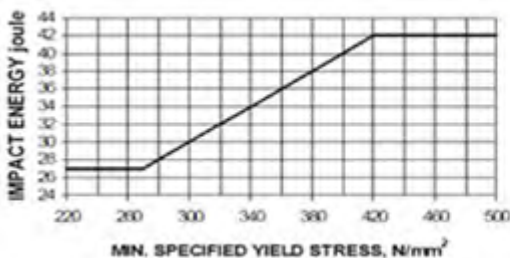
The materials of the offshore container shall be suitable for the intended use and are to be compatible when joined with other materials of different composition in the structure. The manufacturer's material traceability system shall be to the satisfaction of the LRQA surveyor, and material used shall be able to be identified to a grade and standard.

The corner castings shall be supplied with a material certificate in compliance with the requirements of ISO 1161. Material Certificates shall comply with the delivery requirements of ISO 10474 or EN 10204 as per the table below:

Structure	Documentation according to ISO 10474 / EN 10204		
	Inspection certificate 3.2	Inspection certificate 3.1	Test report 2.2
ISO-corner fittings	•		
Pad eyes	•		
Other primary structural members		•	
Secondary structural members			•

Tensile testing shall be performed in accordance with ISO 6892-1.

In order to avoid initiation of brittle fracture, the steels shall possess adequate fracture energy. Steels for primary structures shall be tested by the Charpy impact (V-notch) method in accordance with ISO 148-1. Test temperatures shall be as specified below.



Material thickness (t) mm

t ≤ 12
12 < t ≤ 25
t > 25

Impact test temperature °C

T₀+10
T₀
T₀-20

Note : For normal and higher strength C-Mn steels, the test temperature need not be taken lower than -40°C

Refer to the application standard for impact energy required value, test temperature and test piece size.

Where a material is loaded such that through thickness properties are required then EN 10164 needs to be considered. The scope of EN 10164 is 15mm to 400mm, thus through thickness, also known as z-testing, is not required when the material thickness is less than 15mm. Z-testing ensures that the material used has this property and where applicable for offshore containers Z25 quality plate or better shall be used.

Note 1: For plates of less than 15 mm an engineering justification of the material used can be undertaken based on mechanical testing, ultrasonic testing, or review of chemical and mechanical properties.

Particular attention is drawn to material substitutions. Where a manufacturer wishes to use an alternative material for any part of the offshore containers, if the alternate material is not already specified on the approved drawings the LRQA surveyor must raise a Non-Acceptance Note and the manufacturer must have the design reappraised for the alternative material and approved by LRQA.

External/Internal visual examination

The LRQA surveyor shall confirm the required markings on the offshore container are legible and in accordance with the applicable requirements.

The visual inspection shall confirm that the alignment of the pad eyes meets code requirements, and they shall be aligned with the sling to the centre of lift hook, with a maximum manufacturing tolerance of $\pm 2,5^\circ$. Any difference in the diagonal measurements between lifting point centres shall not exceed 0,2 % of the length of the diagonal, or 5 mm, whichever is greater.

Where the lifting set is supplied with the offshore container, a check that the shackle pin can move freely within the pad eye hole, confirming it is within the 3% to 6% tolerance of the shackle pin diameter to avoid lifting set snag. Where an additional tolerance check, in accordance with the manufacturer's drawing is required, this shall be considered on a case-by-case basis and shall be highlighted on the DAD as a specific point for inspection.

For tank containers the LRQA surveyor shall validate the design to ensure that it is suitably protected from impact damage in accordance with section 5.5.4 of ISO 10855-1.

When fitted, door seals shall operate correctly, drain holes and fork pockets shall be free of debris.

12.2 Inspection of welds

Essential and non-redundant primary structural members shall be welded with full penetration welds.

For offshore containers, welding is to be performed by approved welders to a recognised welding standard, using approved welding procedures, referenced from the application code (e.g. ISO 10855-1 section 8.2.2).

The approval of welding procedures and /or welders shall be performed by Independent Inspection Authorities accredited for the witnessing / Certification of welding and reviewed by LRQA.

Note: Particular attention is drawn to the impact requirements for pad eye welding procedures, e.g. as per Section 8.2.2 of ISO 10855-1, where "For $t > 12$ mm four sets of impact tests shall be performed: one set in the weld metal, one set at the fusion line, one set in the heat affected zone (HAZ) 2 mm away from fusion line and one set 5 mm away from fusion line."

The inspection of welds shall meet the requirements of ISO 5817: Level B for primary structure and as a rule ISO 5817: Level D for secondary structure.

Inspection of the frame and welds shall be undertaken where there is sufficient lighting. Sufficient lighting is generally considered to be at 500 Lux level or above. If for whatever reason there are lighting restrictions, the LRQA surveyor shall ask for alternative ways to perform the inspection to ensure that the offshore container can be adequately inspected.

Category of member	I Visual Examination	II Magnetic particle Examination	III Ultrasonic Examination	IV Radiographic Examination
Essential / Nonredundant primary structure	100%	100%	100% Pad eyes 20% all other	10%
Non-essential primary structure	100%	20%	20%	10%
Secondary structure	100%			

As indicated above, it is essential that primary structure welds are of good quality for resistance to fatigue and for strength, thus for primary structure welds Table 7 of ISO 10855-1 applies as specified above.

100% of all welds shall be visually inspected, 100% of primary structure welds shall be subject to MPI (20% for floor). Ultrasonic examination of the pad eyes and other items shall be undertaken where the geometry of the weld and its set up allows ultrasonic examination, if not possible radiography can be used in replacement to ultrasonic. Dye penetrant may be used where magnetic particle is not possible.

NDE shall be undertaken as per the requirements of the application standard, e.g. Table 8 of ISO 10855-1:

Visual	Magnetic particle	Dye penetrant	Ultrasonic	Radiography
ISO 17637	ISO 17638	ISO 3452-1	ISO 17640	ISO 17636-1 ^a and ISO 17636-2 ^a

a: Class B Improved radiographic techniques shall be used.

The acceptance criteria for the NDE undertaken on primary structure is specified in ISO 10855-1: Table 9

No such acceptance criteria are specified for secondary structure, but to inspect an item without knowing an acceptance criterion to appraise it against is not good engineering practice, thus LRQA CQS specifies that this shall be undertaken to the general criteria of ISO 5817: Level D.

Visual	Magnetic particle	Dye penetrant	Ultrasonic	Radiography
ISO 5817 ^a Level B	ISO 23278 Level 1	ISO 23277 Level 1	ISO 11666 Level 2	ISO 10675-1 ^b Level 1

^a for aluminum ISO 10042 ^b for aluminum ISO 10675-2

Engineering judgement can be used for the interpretation of “general criteria of ISO 5817: Level D, which as per the application standards “The fabrication procedure shall conform to the requirement that the secondary structure shall prevent cargo from falling out of the offshore container and, if required, prevent water from entering.”

Note: Welds between primary and secondary structures shall be performed as for secondary structures and shall be examined as such.

12.3 Production load tests

During the production of a batch of offshore containers, some, selected at random, shall be tested in accordance with the all-point lifting test specified in 6.1 above and shall conform to all specified requirements and witnessed by LRQA Surveyor.

The number of containers to be tested shall be agreed in advance and is dependent on the total number in the production series. The minimum number of containers to be tested, which shall include the container, which was type tested, shall be in accordance with the table below.

As the unit being tested has the secondary structure fitted, which has a beneficial effect for the container to resist deformation, the test allowed deflection is l/300, which is more stringent than the design consideration of l/250. Tests shall be carried out using currently calibrated measuring equipment, traceable to National/ International Standards.

Total number in series	Number to be tested ^a
1-5	1-5
6-10	6-10
11-20	11-20
21-40	21-40
>40	>40

^a The quantity given includes the container which was type tested.

Where the offshore container is specified to be weathertight, 10% of the offshore containers shall be tested in accordance with section 8 above.

A gap of 3 months is permitted for allowance of consideration of containers tested in series. Any time gap larger than this shall be considered a new batch.

Production batches spread between manufacturers, must meet the percentage number of tests for each manufacturer.

12.4 Coating and corrosion protection

The LRQA surveyor shall verify that offshore container roofs, if fitted, are coated with a permanent non-slip medium. Although paint inspection is not a part of the third-party inspection,

where the paint condition is in a condition liable to cause corrosion to the offshore container, this shall be rejected by the LRQA surveyor.

12.5 Rejected offshore containers

All rejected offshore containers shall be reported using a Non-Acceptance Note.

Where the offshore container is rejected due to either weld acceptance criteria or a lifting test requirement the manufacturer shall identify the cause of failure and rectify all affected containers, which shall subsequently be re-inspected and re-tested and LRQA shall be consulted.

13. Reporting, Certification & Marking

The LRQA surveyor shall check that the offshore container possesses the necessary plates, decals for the regulations to be complied with and shall stamp the data plate on final acceptance of the offshore container.

Offshore containers have both a data plate and an inspection plate.

The product standard(s) ISO 10855-1 for offshore containers do not detail specific Country/Client requirements, e.g. units for Singapore require NDT test date. Please consider the location of the units.


OFFSHORE CONTAINER DATA Certified by LRQA IMO MSC/Circ.860 in support of SOLAS Reference standards used LRQA-CQS & ISO 10855-1			
Manufacturer's serial number:			
Month and year of manufacture:			
Maximum gross mass excluding lifting set	kg at	Degrees from vertical
Tare mass:	kg		
Payload:	kg		
Intermediate deck:	kg		
Certificate of conformity no:		<i>hardstamp</i>	
Design temperature:	°C		
OFFSHORE CONTAINER INSPECTION PLATE Inspection reference standards used LRQA-CQS & ISO 10855-3			
Container number:			
Owner:			
Inspections:			
Dd/mm/year	V/VN/T	<i>hardstamp</i>	

The inspection plate has the following possible marking requirements:

V: To indicate visual examination only

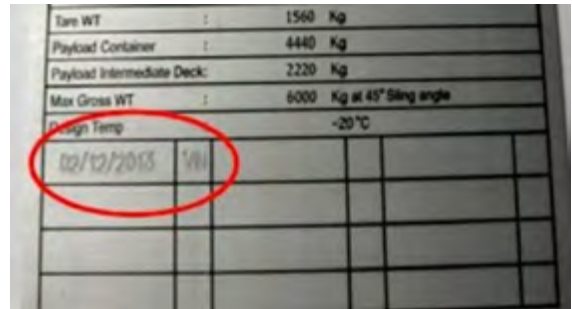
VN: To indicate non-destructive examination and visual examination has been carried out.

T: To indicate proof load test, NDE and visual examination has been carried out.

- The mm/yy DOM on the data plate will have a LRQA stamp  adjacent to it.
- This DOM is the final sign off date.
- The inspection plate will not have an LRQA stamp on it. The inspection plate shall use dd/mm/yy terminology.
- The VN date shall be the final sign off date.

The supporting certificate shall state the NDT test date (dd/mm/yyyy) and date of production test supporting unit.

In the case of any non-conformity, which cannot be resolved on site, a Non-Acceptance Note shall be issued.



Part B In-Service Offshore Containers.

Introduction

Part B of this procedure covers the in-service inspection of Offshore Containers.

Offshore containers are required to be inspected (at a maximum of) 12 months for intermediate inspections and intervals of 48 months for periodic inspections after initial certification. Unless a substantial repair or alteration has been performed then the inspection shall be taken place immediately after.

1. In-service inspection

The owner is responsible for submitting the offshore container for its in-service examination, within the statutory time limits. Offshore containers to be inspected must be safely and easily accessible and must be clean and safe.

Offshore container units which have missed their periodicity of in-service inspection shall be subject to a full periodic in-service inspection, as required within table 1 of ISO 10855-3 and section 1.1 below, with the data plate marked as such.

LRQA authorised surveyors performing in-service inspections shall issue the certification if acceptable, or where the inspection is unacceptable a Non-Acceptance Note (NAN) shall be issued.

In-service inspections shall be undertaken in accordance with the maximum interval requirements specified below.

1.1 Inspections for containers

Time or interval	Inspection/examination/test			
	Lifting test	Non-destructive examination	Visual inspection	Suffix marked
Initial certification	As required by ISO 10855-1			
Interval not exceeding 12 months	Not applicable ^b	Not applicable ^b	Yes	V
Interval not exceeding 48 months	Not applicable ^b	Yes	Yes	VN
After substantial repair or alteration ^a	Yes	Yes	Yes	T

^a A substantial repair or alteration means any repair and/or alteration carried out, which may, in the opinion of an inspection body, affect the primary elements of the offshore container, or elements which contribute directly to its structural integrity.

^b the inspection body may require other or additional inspections, examinations and or tests.

1.2 Inspections for sling sets

Time or interval	Applicable to	Inspection/examination/test			
		Load test	Non-destructive examination	Visual inspection	Suffix marked on sling tag
Initial certification	Complete lifting set	As required by ISO 10855-2			
Interval not exceeding 12 months	Complete lifting set	-	NA	Yes	V
Interval not exceeding 48 months	Sling components and joining links excluding legs	Either load test or NDE b		Yes	T or VN ^e
	Chain sling legs	Either load test or NDE b c		Yes	T or VN ^e
	Shackles	NA	NA	Yes	NA
	Wire rope legs	NA	NA	Yes	NA
After substantial repair or alteration ^a	Complete lifting set	Yes. In accordance with applicable standard d	Yes. In accordance with applicable standard d	Yes	T

a. A substantial repair or alteration means any repair and/or alteration carried out, which may, in the opinion of an inspection body, affect the integrity of the lifting set.

b. The inspection body may require other or additional inspections, examinations and or tests.

c. NDE to be performed on the end links of each leg + 10 % of the leg length. The location of the 10 % to be based on visual examination.

d. Applicable standards include EN 818-6.

e. Dependent upon whether tested or examined.

Table 4 ISO 10855-3

2. (Annual) Intermediate inspection

The offshore container shall have the following inspections:

Container	Lifting set	Marking of nameplate
Visual Inspection of the Container frame	Visual Inspection of the Lifting set	The nameplate shall be marked with a 'V'

3. (Four yearly) Periodic inspection

Container	Lifting set	Marking of nameplate
Visual Inspection of the Container frame NDE of the container frame	Visual Inspection of the Lifting set Load test or NDE of the lifting set	The nameplate shall be marked with a "T" if visual and load test is performed or "VN" if visual and NDE is performed.

4. Frame & weld inspection

Offshore Container Welds shall not show any sign of degradation. It is not a requirement to remove paint to see the welds at the in-service inspection. At the 4-yearly periodic tests the owner has the option of NDT by either MPI or Eddy Current Testing, if Eddy Current Testing is selected then the paint will also remain on the welds. The following information is considered for routine periodic inspection, however for repairs and modifications all welds shall be 100% inspected.

Technique	Visual Inspection	Magnetic Particle	Dye Penetrant	Ultrasonic	Radiography	Eddy Current
Method	ISO 17637	ISO 17638	ISO 3452-1	ISO 17640	ISO 17636-1 & ISO 17636-2a	EN 1711
Acceptance Criteria	ISO 5817 Level B	ISO 23278 Level 1	ISO 23277 Level 1 ISO 10675-2 Level 1	ISO 11666 Level 2	ISO 10675-1 Level 1	ISO 5817 Level B ISO 10042 Level B

Inspection of the frame and welds shall be undertaken where there is sufficient lighting, a minimum of 500 Lux is required.

The LRQA surveyor shall visually inspect the offshore container, including the underside, to check for defects & deformations.

The LRQA surveyor shall ensure that the offshore container does not include any 'drop hazards' such as debris in the fork pockets. This is easiest to achieve when the operator lifts the offshore container (for the underside inspection) and viewing the fork pockets at eye level.

The following checks shall also be undertaken by the LRQA surveyor, which are specified from the Oil & Gas UK publication "Best Practice for the Safe Handling of Cargo to & From Offshore Locations (Issue 6)".

Check top surfaces for dropped objects.	Check to ensure the securing points are in good condition.	Ensure there are no potential internal snagging hazards.
Check unit has sufficient test certification remaining for proposed trip.	Check lifting accessories for damage and that shackles are suitable and secured correctly.	Check unit has not been loaded with more than the designated payload.
Check doors and locks for damage.	Check unit for excessive corrosion and/or deformation.	Check the locking mechanism is secured on both door handles. Ensure that a signed and dated outbound/inbound label is attached.
If stored on stony/soft surfaces there may be debris caught underneath unit which could create a potential dropped object.	Ensure drainage holes are clear of debris but not large enough to create dropped objects.	Ensure forklift pockets (transverse and longitudinal) are clear of debris.

Doors, frames, seals, hinges, locks shall be visually inspected and the functionality shall be checked to ensure that they operate in a satisfactory manner without undue force being required. The floor shall be visually inspected to check for deformation and that it shows no signs of distress or overload. Drainage facilities, where fitted, shall be inspected – the drain holes shall be clear of debris.

Where the offshore container has snag hazards fitted, e.g. lifting points giving rise to bulwark snagging, the LRQA surveyor shall discuss this with the owner, and refer to the O&GUK publication section 9.10 and make a note on the inspection report that the container should be modified to eliminate the bulwark snagging risk or alternatively refer to section 9.10.2.1 of the O&GUK publication for shipping.

The frame shall comply, as a minimum, with the requirements of CSC, specifically for the following (Primary Structure) structurally sensitive components a container should be examined for serious deficiencies:

- 1) Top rail
- 2) Bottom rail
- 3) Header
- 4) Sill
- 5) Corner posts
- 6) Corner and intermediate fittings.

The effect of two or more items of damage in the same structurally sensitive component, even though each is less than that specified in the above table, could be equal to, or greater than, the effect of a single item of damage listed in the table. In this case the damage should be reported to LRQA and be repaired under the supervision of the LRQA surveyor where the scope of the exceptional inspection is agreed.

When using the acceptance criteria in the tables below, the overall deformation is the total deformation (single or multiple defects) combined on the same member, where such defects are in close proximity, which is specified as being within 300 mm of each other:

E.g., a component has 3 defects at 20mm long x 5mm deep, which are at locations 1000mm, 1200mm and 1450mm from the datum – as these defects are within 300mm of each other they shall be added together (20mm+ 20mm+ 20mm = 60mm) - totalling 60mm long x 5mm deep or 1 defect at 60mm long x 5mm deep which requires a repair.

The below tables show the maximum acceptable deformations during inspection.

Table 1 is the CIC-2 inspection criteria and should be used during inspections. Table 2 is the CSC inspection criteria and if any deformation reaches these limits the container should be removed from service and repaired immediately. Clients should have some margin before the limits of Table 2 are met, which it is recommended that they are per the table 1 limits, both inspection criteria specified should be used in parallel with each other. If during the inspection table 2 is exceeded the LRQA surveyor shall issue a non-acceptance note.

Table 1- CIC-2 Inspection criteria - Information as used in table 2 below is used in courtesy of Container Owners Association

Component	Condition	Maximum acceptable deformation
All rails, including side rails, headers and sills and welds to corner fittings	Holed, cut, torn or cracked; broken component and/or weld Missing or loose parts or fasteners	REPAIR
Top side rail	Any deformation such as bend, bow, dent, etc.	If more than 30 mm (1-3/16 in) deep - REPAIR
Front headers & Rear headers	Any deformation such as bend, bow, dent, etc. EXCEPT on a header extension plate or corner protection plate	if more than 35 mm (1-3/8 in) deep - REPAIR
Bottom side rails, front and door sills	Any deformation such as bend, bow, dent, etc.	if more than 50 mm (2 in) deep – REPAIR
	Any deformation such as bend, bow, dent, etc. ON A FLANGE	If torn, cracked, or cut - REPAIR
Door headers, rain gutter or sills	Interference with door closure, securement and/or weather tightness	REPAIR
All corner posts, including J-bars	Holed, cut, torn or cracked broken component and/or weld.	REPAIR
	Any deformation, such as bend, bow, dent, etc.	If more than 20mm (13/16”) regardless of length or location - REPAIR
	Outward deformation	If more than 5mm (3/16”) beyond. The plane of end surfaces or 10mm (3/8”) beyond plane of side surfaces of corner fittings REPAIR

Component	Condition	Maximum acceptable deformation
Rear corner posts	Any deformation causing interference with door operation, securement or weather tightness	REPAIR
J-bars	Any deformation such as bend, bow, dent, etc. Door	Door must be able to open fully (270°). If door operation is impaired – REPAIR
All side/front panels	Holed, cut, torn or cracked; broken component and/or weld	REPAIR
	Missing or loose parts or fasteners	REPAIR
	Inward deformation, such as bend, bow, dent, etc.	If more than 35mm (1-3/8”) measured on an exterior recessed corrugation - REPAIR
Side Panels	Outward deformation, such as bend, bow, dent, etc.	If more than 30mm (1-3/16”) measured on an interior recessed corrugation - REPAIR
Front Panels	Outward deformation, such as bend, bow, dent, etc.	If more than 15mm (1-3/16”) measured on an inside recessed corrugation - REPAIR
Lashing fittings	Broken parts and/or welds; missing or loose parts or fasteners	REPAIR
Ventilator covers	Broken, missing, etc.	If cracked or broken in the enclosed baffled area of ventilator REPAIR
Door assembly, including hardware	Holed, cut, torn or cracked; broken component and/or weld	REPAIR
	Missing or loose parts or fasteners	REPAIR
	Any deformation, such as bend, bow, dent, etc.	If door operation or securement is impaired, REPAIR
	Seized, frozen or stiff	If door operation or securement is impaired, REPAIR
	Not light-tight	REPAIR
Door panels	Any deformation such as bend, bow, dent, etc.	If internal cube intrusion is greater than 35 mm (1-3/8 in), - REPAIR
Door gaskets	Loose or missing Cut, torn, cracked, or burned	If not light-tight or if the outer lips of the top horizontal gaskets are not fully in place and seated against the header - REPAIR
Roof panels, header extension plates and corner protection plates	Holed, cut, torn, or cracked; broken component and/or weld	REPAIR
Corner protection plates and header extension plates	Any deformation, such as bend, bow, dent, etc.	If more than 40 mm (1-9/16”) below the top surfaces of top side rails - REPAIR
All roof panels	Downward deformation such as bend, dent etc.	If more than 40 mm (1-9/16”) below top surfaces of top side rails - REPAIR
	Upward deformation such as bend, dent etc.	If more than 40 mm (1-9/16”) above top surfaces of top side rails - REPAIR
Floor and centre rail	Holed	REPAIR If light leaks, regardless of diameter of hole
Wooden flooring	Delamination or splinters	REPAIR
	Downward deformation such as a bend or bow	If more than 15 mm (9/16 in) measured transversely at the floor screw centre line – REPAIR
	Gouges (regardless of length)	REPAIR If more than 15 mm (9/16 in) deep OR if more than 5 mm (3/16 in) deep and width of more than 150 mm (6 in) of the gouge, REPAIR

Component	Condition	Maximum acceptable deformation
Plank flooring	Cracked or Split	If light leaks, - REPAIR
All roof panels	Downward deformation such as bend, dent etc.	If more than 40 mm (1-9/16") below top surfaces of top side rails - REPAIR
	Upward deformation such as bend, dent etc.	If more than 40 mm (1-9/16") above top surfaces of top side rails - REPAIR
Threshold Plate	Bent Upwards	If more than 5 mm (3/16 in), - REPAIR
Wooden flooring	Delamination or splinters	REPAIR
	Downward deformation such as a bend or bow	If more than 15 mm (9/16 in) measured transversely at the floor screw centre line – REPAIR
	Gouges (regardless of length)	REPAIR If more than 15 mm (9/16 in) deep OR if more than 5 mm (3/16 in) deep and width of more than 150 mm (6 in) of the gouge, REPAIR
Crossmembers, Forklift pocket components (including straps), Outriggers Gooseneck tunnel components	Holed, cut, torn, or cracked; broken component and/or weld	REPAIR
	Missing or loose parts or fasteners	REPAIR
	Downward deformation, such as bend, bow, dent, etc.	If more than 15 mm (9/16 in) from its original position or below the plane of the lower surfaces of the bottom corner fittings - REPAIR
	Any deformation such as bend, bow, dent, etc. ON A WEB	If more than 50 mm (2 in) in any direction, REPAIR
	Any deformation such as bend, bow, dent, etc. ON A BOTTOM FLANGE	If torn, cracked, or cut - REPAIR
	Any deformation such as bend, bow, dent, etc. ON A TOP FLANGE	If intrusion into container is more than 50 mm REPAIR
	TOP FLANGE separated from bottom of wood or steel flooring	If separation at point of attachment to floor, measured at the formed edge of the top flange, is more than 10mm (3/8 in), REPAIR
Gooseneck tunnel assembly and forklift pocket top plate	Any deformation such as bend, bow, dent, etc.	If more than 50 mm (2 in) REPAIR
Markings required by regulations / standards	Missing, loose or defaced	REPAIR
Markings required by owner	Missing, loose or defaced	Consult with owner
Marking plates	loose, broken, missing plate or fasteners; illegible data	REPAIR
CSC Safety approval plate	Periodic examination mark	Examination according to owners approved procedure
Corner fittings and their weld attachments	Cracked, loose, broken; apertures outside ISO	REPAIR
Entire Container	Any deformation such as bend, bow, dent, etc. that affects ISO required diagonal dimensions between comer fitting apertures	If deformation exceeds ISO tolerances, REPAIR

Component	Condition	Maximum acceptable deformation
End frame components (corner posts, doors, headers, sills, corner fittings)	Any deformation such as bend, bow, dent, etc. that affects other ISO required dimensions	If deformation exceeds ISO tolerances plus 5 mm (3/16") on end faces or plus 10 mm (3/8") on side faces, REPAIR
Corrosion	Structurally unsafe Holed	REPAIR Note: only use an approved inspection hammer to investigate corrosion. Repair
Improper repairs	Structurally safe Structurally unsafe	No Action REPAIR
Cleaning	Dangerous goods residue Pest infestation Contamination or odour that can be transferred. Foreign material, lashings or dunnage impeding loading of cargo	REMOVE in compliance with health & safety procedures. REMOVE in compliance with health & safety procedures. REMOVE REMOVE
Surfaces	Glue or tape (Sticky) Offensive graffiti or misleading foreign marks Hazard placards / labels	REMOVE REMOVE REMOVE
Ventilators	Blocked, loose, damaged and not weathertight, missing	REPAIR
Front and door headers Door assembly		OUTWARDS: Maximum 5 mm (3/16") beyond plane of end surfaces of corner fittings UPWARDS (headers): Maximum 4 mm (5/32") above plane of upper surfaces of top corner fittings
Front and door sills		OUTWARDS: Maximum 5 mm (3/16") beyond plane of end surfaces of corner fittings DOWNWARDS: Not below the plane of the lower surfaces of the bottom corner fittings
Fork-lift pocket strap		DOWNWARDS: Minimum 10 mm (3/8") above plane of the lower surfaces of the bottom corner fittings UPWARDS: See "Fork-lift pocket opening HEIGHT" below
Fork-lift pocket opening		WIDTH: "LOADED" pockets: Minimum 345 mm (13 5/8") EMPTY pockets: Minimum 295 mm (11 5/8 in) HEIGHT: "LOADED" pockets: Minimum 105 mm (4 1/8") EMPTY pockets: Minimum 92 mm (3 5/8 in)
Gooseneck tunnel		LENGTH: Minimum 3140 mm (123-7/8"); Maximum 3510 mm (138-1/4") WIDTH of tunnel opening X: Minimum 1019 mm (40-1/8"); Maximum 1042 mm (41") HEIGHT of tunnel opening B: Minimum 107 mm (4-1/4"); Maximum 130 mm (5-1/8")
Door opening		WIDTH: Minimum 2281 mm (89-13/16") HEIGHT: 8' high container: Minimum 2129 mm (83-13/16") 8'6" high container: Minimum 2256 mm (88-13/16") 9'6" high container: Minimum 2560 mm (98-13/16")

Table 2 - CSC Structurally Sensitive Components and Definition of Serious Structural Deficiencies for Consideration

Information as used in table 3 below is used in courtesy of CSC.1/Circ.138/Rev.1

Structurally sensitive components	Serious deficiency requiring immediate out of service determination <i>(see also section 10.5)</i>	Deficiency requiring advice to owner and restrictions for transport	Restrictions to be applied in case of deficiencies according to column (iii)			
			Empty container		Loaded container	
			See transport	Other modes	See transport	Other modes
Top rail	Local deformation to the rail more than 60 mm or cracks or tears more than 45 mm in length. (see Note 1)	Local deformation to the rail more than 40 mm or separation or cracks or tears more than 10 mm in length. (see Note 1)	No restriction	No restriction	Bottom Lifting not allowed. Top lifting allowed only by use of spreaders without chains.	Bottom Lifting not allowed. Top lifting allowed only by use of spreaders without chains.
Bottom rail	Local deformation perpendicular to the rail more than 100 mm or separation cracks or tears in the rail's material more than 75 mm in length (see note 2)	Local deformation perpendicular to the rail more than 60 mm or separation cracks or tears in the rail's material of the upper flange more than 25 mm in length: or of web in any length (see note 2)	No restriction	No restriction	Lifting at (any) corner fitting not allowed	Lifting at (any) corner fitting not allowed
Header	Load deformation to the header more than 80 mm or cracks or tears more than 80 mm in length	Load deformation to the header more than 50 mm or cracks or tears more than 10 mm in length	Container shall not be over stowed	No restriction	Container shall not be over stowed	No restriction

Structurally sensitive components	Serious deficiency requiring immediate out of service determination (see also section 10.5)	Deficiency requiring advice to owner and restrictions for transport	Restrictions to be applied in case of deficiencies according to column (iii)				
			Empty container		Loaded container		
			See transport	Other modes	See transport	Other modes	
Sill	Local deformation to the post more than 100 mm or cracks or tears in excess of 100 mm in length	Local deformation to the post more than 60 mm or cracks or tears in excess of 10 mm in length	Container shall not be over stowed	No restriction	Container shall not be over stowed	No restriction	
Corner posts	Local deformation to the post more than 50 mm or cracks or tears in excess of 50 mm in length	Local deformation to the post more than 30 mm or cracks or tears of any length. Weld separation of adjoining components of 50 mm or less.	Container shall not be over stowed	No restriction	Container shall not be over stowed	No restriction	
Corner and intermediate fittings	Missing corner fittings, any through cracks or tears in the fitting, any deformation of the fitting that precludes full engagement of the securing or lifting fittings (see Note 3) or any weld separation or adjoining components in excess of 50 mm in length		Container shall not be lifted on board a ship if the damaged fittings prevent safe lifting or securing	No restriction Container shall be lifted and handled with special care	Container shall not be lifted on board a ship	Container shall be lifted and handled with special care	
			Any reduction in the thickness of the plate containing the top aperture that makes it less than 25 mm thick.	Container shall be lifted and handled with special care. Container shall not be over stowed when twist locks have to be used.	Container shall be lifted and handled with special care	Containers shall not be lifted by the top corner fittings	Container shall be lifted and handled with special care
			Any reduction in the thickness of the plate containing the top aperture that makes it less than 26 mm thick.	Containers shall not be over stowed when fully automatic twist locks are to be used.	Container shall be lifted and handled with special care.	Containers shall not be used with fully automatic twist locks.	Container shall be lifted and handled with special care

Note 3: The full engagement of securing or lifting is precluded if there is any deformation of the fitting beyond 5 mm from its original plane, any aperture width greater than 66 mm, any aperture length greater than 127 mm or any reduction in thickness of the plate containing the top aperture that makes it less than 23 mm thick

Structurally sensitive components	Serious deficiency requiring immediate out of service determination (see also section 10.5)	Deficiency requiring advice to owner and restrictions for transport	Restrictions to be applied in case of deficiencies according to column (iii)			
			Empty container		Loaded container	
			See transport	Other modes	See transport	Other modes
Understructure	Two or more adjacent cross members missing or detached from the bottom rails. 20% or more of the total number of cross members missing or detached. (see note 4).	One or two cross members missing or detached (see Note 4)	No restriction	No restriction	No restriction	No restriction
		More than two cross members missing or detached (see Notes 4 & 5)	No restriction	No restriction	Maximum payload shall be restricted to 0.5 x P	Maximum payload shall be restricted to 0.5 x P
<p>Note 4: If onward transport is permitted according to sections 10.5, it is essential that detached cross members are precluded from falling free.</p> <p>Note 5: Careful cargo discharge is required as forklift capability of the understructure might be limited.</p>						
Locking rods	One or more inner locking rods are non-functional (see Note 6)	One or more inner locking rods are non-functional (see Note 6)	Container shall not be over stowed	No restriction	Container shall not be over stowed. Cargo shall be secured against the container frame and the door shall not be used to absorb acceleration forces - otherwise maximum payload shall be restricted to 0.5 P	Cargo shall be secured against the container frame and the door shall not be used to absorb acceleration forces - otherwise maximum payload shall be restricted to 0.5 P
<p>Note 6: Some containers are designed and approved (and so recorded on the CSC plate) to operate with one door open or removed.</p>						

5. Examination of wire rope sling sets

An inspection is a visual check on the condition of the sling to identify any obvious damage or deterioration that might affect its performance. The sling should be withdrawn from service and referred to a competent person for thorough examination if any of the following is observed at inspection:

- a) **Illegible sling markings i.e. sling identification and/or working load limit of the unit/container.**
- b) **Wear, distortion and/or cracking of the upper or lower terminals and/or ferrules.**
- c) **Concentration(s) of broken wires.**
- d) **Severe rope distortion, such as kinks or protrusion of the core.**
- e) **Significant rope wear.**
- f) **Corrosion.**
- g) **Heat damage.**

Following examination of a sling with illegible markings and unless it can be shown that the sling was fabricated from rope having a grade other than 1770, the competent person should assume that the

rope grade is 1770 when determining the new working load limit (WLL).

The inspection of the lifting set shall include a check that the lifting set aligns and fits correctly to the offshore container and that the shackle pins are adequately sized (i.e. not too small to cause peak stresses, and not too large; the -1/+3% tolerance applies).

A thorough examination shall be carried out at intervals not exceeding twelve months. This interval should be reduced when necessary or when there is suspicion that the equipment has been misused or is unserviceable. To facilitate examination, slings may need to be cleaned to be free from oil, dirt, and rust prior to examination. This can usually be accomplished by using a wire brush. Other methods may be used providing that the parent metal is not damaged. Methods to avoid are those using acids, overheating or removal of metal. Records of all examinations should be suitably maintained.

5.1 Documentation

Prior to inspection, the LRQA Surveyor will check the supporting documentation including a valid test certificate and to ensure that the information below is available:

- a) **The diameter**
- b) **Number of strands**
- c) **Number of wires in a strand**
- d) **Type of core**
- e) **Lay and lay direction**
- f) **Steel grade**
- g) **Date the top was tested**
- h) **The rope's actual breaking strength (If tested), or its calculated aggregate strength**

The sling should be withdrawn from service if any of the following conditions are observed. Components that are cracked, distorted, twisted, severely corroded, or have deposits that cannot be removed should be discarded and replaced.

5.2 Sling markings

The sling markings, i.e. information on the sling identification and /or the working load limit, are illegible.

6. Damaged upper and lower terminals

Wear, distortion or cracking of the upper or lower terminals. NOTE: Be mindful to signs of opening, distortion or cracking of the hook, distortion and wear of links or the closing of the thimble. This can indicate that the sling has been overloaded.

7. Damaged rope terminations

Wear, distortion or cracking of ferrules or depart of a splice.

8. Broken wires

Broken wires are detrimental because there could be a possibility of injury to the users hands or the loss of strength and performance of the rope:

Broken wires are usually caused by mechanical damage, although corrosion can be a factor. The appearance of well distributed broken wires may have no

effect on the strength of the sling, but the discard criteria below should be adopted for randomly distributed broken wires and concentrated broken wires respectively.

8.1 Randomly distributed broken wires

6 randomly distributed broken outer wires in a length of 6d but no more than 14 randomly distributed broken wires in a length of 30d where d is the nominal rope diameter.

8.2 Concentrated broken wires

3 adjacent broken outer wires in one strand.

8.3 Rope distortion

Kinking, crushing, bird caging or core protrusion or other damage which distorts the rope structure.

NOTE: *The main thing to look for is wires or strands that are pushed out of their original positions in the rope. Slight bends in a rope where wires or strands are still relatively in their original positions would not be considered serious damage.*

8.4 Rope wear

10% of the nominal rope diameter (d).

9. Examination of chain rope sling sets

An inspection is a visual check on the condition of the sling to identify any obvious damage or deterioration that might affect its performance. The sling should be withdrawn from service and referred to a competent person for thorough examination if damaged.

The inspection of the lifting set shall include a check that the lifting set aligns and fits correctly to the offshore container and that the shackle pins are adequately sized (i.e. not too small to cause peak stresses, and not too large to size; the -1/+3% tolerance applies)

If the tag or label used to identify the chain sling and its working load limit becomes detached and the necessary information is not marked on the master link itself, or by some other means, the chain slings should be withdrawn from service. The chain

sling should be withdrawn from service and referred to a competent person for thorough examination if any of the following are observed: -

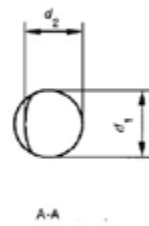
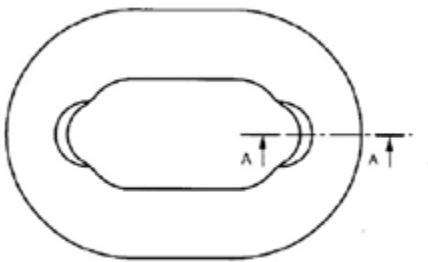
- The chain sling markings are illegible, i.e. information on the chain sling identification and/or the working load limit.
- Distortion of the upper or lower terminals.
- Chain stretch. If the chain links are elongated or if there is any lack of free articulation between the links or noticeable difference in the leg length of multi-leg chain slings, the chain may have been stretched.
- Wear by contact with other objects usually occurs on the outside of the straight portions of the links where it is easily seen and measured. Wear between adjoining links are hidden.

The chain should be slack and adjoining links rotated to expose the inner end of each link. Inter-link wear, as measured by taking the diameter indicated (d1) and one at right angles, (d2) may be tolerated until the mean of these diameters has been reduced to 90 % of the nominal diameter (dn) provided that:

$$0.5 (d1 + d2) > 0.9dn.$$

- Cuts, nicks, gouges, cracks, excessive corrosion, heat discoloration, bent or distorted links or any other defects.
- Signs of "opening out" of the hooks, i.e. any noticeable increase in the throat openings or any other form of distortion in the lower terminal.

The increase in throat opening should not exceed 10 % of the nominal value or be such as to allow the safety latch, if fitted, to become disengaged.



A thorough examination should be carried out by a competent person at intervals not exceeding twelve months. This interval should be reduced when necessary or when there is suspicion that the equipment has been misused or is unserviceable. Records of these examinations should be maintained. Chains slings should be thoroughly cleaned to be free from oil, dirt, and rust prior to examination. Any cleaning method which does not damage the parent metal is acceptable. Methods to avoid are those using acids, overheating, removal of metal or movement of metal which may cover cracks or surface defects. Adequate lighting of >500 Lux should be provided, and the chain sling should be examined throughout its length to detect any evidence of wear, distortion, or external damage.

9.1 Examination of shackles

Shackles should be inspected every 6 months; the inspection chart shall be reviewed by the LRQA Surveyor annually when they undertake their inspection. The LRQA Surveyor shall ensure that: -

- The body and the pin of the shackle are both identifiable as being of the same size, type and make.
- All markings are legible.
- The threads of the pin and the body are undamaged.
- The body and pin are not distorted.
- The body and pin are not unduly worn.
- The body and pin are free from nicks, gouges, cracks, and corrosion.

During the inspection the LRQA Surveyor shall verify that, where appropriate, the pin is finger tight and correctly screwed into the shackle eye, the pin is of the correct length so that it penetrates the full depth of the screwed eye and allows the collar of the pin to bed on the surface of the drilled eye. In all cases, when the pin is correctly fitted in the body of the shackle, the jaw width should not be significantly reduced.

Note: *Incorrect seating of the pin may be due to the pin being bent, the thread fitting may be too tight or misaligned to pin holes. Do not use the shackle under these circumstances.*

Indications greater than 2 mm in length shall not be permitted in areas of the component subjected to tensile stresses, in all foreseeable service conditions.

10. NDE of the container frame

The pad eyes and the welds connecting the pad eyes to the frame shall be 100% MPI tested every four years, by an NDE operator qualified to a minimum of ISO 9712 Level 2, using EN ISO 17638 for the process and EN ISO 23278: Level 1 as the acceptance criteria.

11. Load test of the lifting set

As an alternative to NDE, the owner can load test the lifting set. A test load of 2 x WLL shall be applied for a duration of 2,5 minutes to each sling leg without shock for the leg rated to EN 818-4: Table 3 +- 2%. The lifting set shall show no permanent deflection or defects as specified in sections 6 to 9 above. Measuring equipment shall be currently calibrated, traceable to National/ International Standards.

12. Exceptional inspections - repairs and modifications

Repairs and modifications shall be recorded by a factual report to accompany an “exceptional certificate.”

LRQA will issue a factual report documenting the repairs and modifications undertaken on the unit, to accompany the “exceptional certificate”. A partial or full Design appraisal document (DAD) is required for exceptional inspections and where the type approval has been modified or if calculations are necessary.


The repair or modification shall ensure that the container is at least in as good a condition as the originally manufactured container and shall consider the acceptance criteria specified for the original build. For any exceptional inspection the original type approval and manufacturing drawings will be required to ensure that the repair or modification is at least in accordance with the original specification. For an exceptional inspection, the modification or repair is the item that is being appraised and approved, it is not the whole container.

The exceptional inspection shall consider the following aspects:

- A repair or modification method statement, drawing, specification, or procedure issued by the client detailing the repair and/or modification.
- A review of the repair depots competence.
- The weld procedures, welder approvals shall be in accordance with the original application code / standard.
- Material certification and impact test requirements shall be in accordance with the original application code / standard.
- Repairs to the framework shall be undertaken in accordance with the IICL repair manual.
- Repairs to a pressure vessel, shall consider the application code / standard.
- Repairs to the lifting set shall not be undertaken but items are to be replaced.
- After any modification to the primary structure, as a minimum an all-point (4-point) lift test shall be undertaken.
- The LRQA surveyor shall decide if additional tests are required, e.g. Fork Pocket Lift Test for fork pocket replacements.
- Testing following modifications to the primary structure shall be agreed between the client and the attending LRQA surveyor.
- NDT shall be in accordance with the original application code / standard and shall be performed following the lift test(s).
- NDE operators shall be qualified to a minimum of ISO 9712 Level 2, procedure and acceptance criteria shall be in accordance with the original application code / standard.
- In the case of any doubt refer to LRQA.

13. Marking and stamping

LRQA Surveyor shall check that the container has all the required data plates and correct markings.

The offshore container nameplate shall be marked: on the inspection data plate as: Date, Suffix, LRQA Stamp e.g. 02/2020 VN 

If new shackles are fitted, they shall conform to the requirements specified in the type approval. The change of shackle serial number shall be marked in the right-hand column (unshaded column).

OFFSHORE CONTAINER INSPECTION DATA		
Container no.:		
Owner:		
Inspections:		
1		
2		
3		
4		
10		

If LOLER requirements additionally apply, please contact LRQA for further advice.

The LRQA surveyor shall check that the container possesses the necessary CSC and customs plates and the correct markings and decals. Missing plates or markings must be replaced in accordance with the requirements of the type approval / initial approval.



14. Reporting

The attending LRQA surveyor will issue the appropriate certification on successful completion of the In-Service Offshore container unit inspection. Where the inspection is unacceptable a non-acceptance note shall be issued to the client. The NAN shall be closed out prior to any further work being undertaken and before the release of any outstanding certification.

A copy of all the relevant documentation including certificates shall be retained by LRQA.

Get in touch

Visit www.lrqa.com or more information

LRQA
 1 Trinity Park
 Bickenhill Lane
 Birmingham
 B37 7ES
 United Kingdom

