
No. 91 Guidelines for Approval / Acceptance of Alternative Means of Access

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1. REFERENCES

SOLAS II-1/3-6, as amended by Resolution MSC.151(78)

Amendments to the Technical Provisions for Means of Access for Inspections MSC.158(78)

IACS UI SC191

IACS UR Z10.1, 10.2, 10.4 and 10.5

IACS Recommendations:

- No.39 Safe use of rafts or boats for survey
- No.42 Guidelines for Use of Remote Survey Techniques
- No.72 IACS Confined Space Safe Practice
- No.76 IACS Guidelines for Surveys, Assessment and Repair of Hull Structure – Bulk Carriers
- No.78 Safe Use of Portable Ladders for Close-up Surveys

TSCF Guidelines for the inspection and maintenance of double hull tanker structure

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(cont)**2. INTRODUCTION**

This annex describes guidance for the approval or acceptance, as appropriate, of alternative means of access to be provided for compliance with SOLAS II-1/3-6. The Ship Structure Access Manual approved in accordance with SOLAS II-1/3-6 should identify the access arrangements including permanent and alternative means of access as necessary to carry out overall and close up examination and thickness measurements of any structural member. This annex also covers means of access used independently or in combination with the provided permanent means of access to areas to be surveyed and measured in accordance with SOLAS II-1/3-6.

3. DEFINITIONS

Approved means that the construction and materials of the means of access and any attachment to the ship's structure should be to the satisfaction of the Administration. Compliance with the procedures in this annex will satisfy the requirements of an administration in the absence of any specific instructions from a specific administration.

Acceptance: it should be demonstrated to the satisfaction of the Owner that the equipment provided has been maintained and is, where applicable, provided with operators who are trained to use such equipment. This should be demonstrated to the surveyors by the production of documents, prior to the equipment being used, which demonstrate that the equipment has been maintained and which indicate any limitations of the equipment.

Initial survey: the means of access should be subject to an initial survey prior to the delivery of the ship, in accordance with regulation I/10 and it should be demonstrated that the means of access specified in plans required by SOLAS II-1/3-6 paragraphs 4.1.1, 4.1.2 and 4.1.3 are obtainable.

Alternative means of access is a term within SOLAS II-1/3-6 and the Technical Provisions (TP) for *portable or movable means of access* provided for the survey and thickness measurements of hull structure in areas otherwise not accessible by permanent means of access. For the purpose of this annex, alternative means of access include supplementary or additional means to provide necessary access for surveys and thickness measurements in accordance with SOLAS II-1/3-6.

Portable means of access are means that generally may be hand carried or arranged by the crew, e.g. ladders, small platforms and staging. Portable means specified as part of the Ship Structure Access Manual should be carried onboard the ship throughout the duration of the validity of the relevant access manual.

Movable means of access may include devices like a 'cherry picker', wire lift platforms, rafts or other means. Unless otherwise specified in the TP or this UI, such means need not necessarily be kept on board or capable of being operated by the ship's crew. However arrangements for the provision of such means should be addressed during survey planning. Movable means of access should be included in the Ship Structure Access Manual to designate the extent of access to the structural members to be surveyed and measured.

Authorised person is a specified Company person using the means of access who should assume the role of inspector and check for obvious damage prior to using the access arrangements. Whilst using the means of access the inspector should verify the condition of the sections used by close up examination of those sections and note any deterioration in the provisions. Should any damage or deterioration be found, the effect of such deterioration should be assessed as to whether the damage or deterioration affects the safety for continued use of the means of access. Deterioration found that is considered to affect safe use should be determined and measures should be put in place to ensure that the affected section(s) should not be further used prior effective repair.

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4. GENERAL

It is recognised that permanent means of access specified in the TP will not give access to all areas required to be surveyed and measured. Therefore, it is necessary that all areas outside of reach (i.e., normally beyond hand's reach) of the permanent means of access should be accessed by alternative means in combination with the permanent means of access, including those specified by resolution A.744(18), as amended.

Means of access, including alternative means of access, specified in the TP together with the Ship Structure Access Manual should be approved (where appropriate) and where authorised, on behalf of the Administration. In lieu of the alternative means of access required by the regulations and TP, innovative means of access may be allowed, based on case by case acceptance, see section 5.7.

When an alternative means of access is supplied by the builder for compliance with SOLAS regulation II-1/3-6 and TP, it can be approved (where appropriate) and where authorised, on behalf of the Administration, by the Classification Society, to a recognised National or International Standard. Any limitations to the use of the equipment at sea or in port should be described in the approved Ship Structure Access Manual.

Where movable means of access are supplied by a shore-based provider, then the confirmation of its safe and adequate use should be made by the Owner based on recorded maintenance and inspection regime by the provider of the equipment. Cognisance should be taken of the complexity of the equipment when making the judgement on the periodicity of inspections and thoroughness of maintenance by the provider of equipment. The surveyor has the right to reject moveable means of access if not satisfied with the documentation or condition of the equipment.

It should be demonstrated as part of the initial survey, that the means of access identified in the Ship Structure Access Manual provides the required access, prior to delivery for the first ship in the series, or prior to initial use of a Ship Structure Access Manual where an existing means of access is amended, or a new means of access is added.

It should be demonstrated by the Owner that the equipment provided has been maintained and a person operating the equipment is trained in the safe use of such equipment. These should be demonstrated to the surveyors by the production of documents, prior to the equipment being used, which demonstrate that the equipment has been maintained and which indicate any limitations of the equipment.

The records of training, inspections and maintenance should be established in accordance with requirements of the Ships Safety Management System.

All classification surveyors should apply their own classification safe method of working requirements. See also the relevant IACS UR Z10 requirements for Access to Structures.

5. ALTERNATIVE MEANS OF ACCESS

The Owners are responsible for ensuring that alternative means of access are suitable for the purpose of the appropriate use. The equipment where applicable should be operated by qualified personnel and evidence should be provided that the equipment has been properly maintained by a shore-based provider.

The standing platform should be fitted with anchor points for attaching fall arrest systems. For equipment provided with a self levelling platform, care should be taken that the locking device is engaged after completion of manoeuvring to ensure that the platform is fixed.

5.1 Hydraulic arm vehicles (“Cherry Picker”)

5.1.1 Application

Hydraulic arm vehicles or aerial lifts (“Cherry Picker”) may be used to enable the examination of the cargo hold structure on bulk carriers not accessible by permanent ladders fitted in accordance with Table 2 paragraph 1.6. In the Ship Structural Access Manual the Cherry Pickers may be accepted as movable means, for use up to 17 m above the tank top.

5.1.2 Safety routines

Safety measures, including the following, should be taken by an authorised person prior to survey to the satisfaction of the attending surveyor(s):

- Lift controls, including safety devices should be serviceable and should be operated throughout the range prior to use. Operators should be trained;
- The equipment range of use should be agreed with the operator before using the equipment;
- Operators should work within the basket;
- Body belts (such as harnesses) with lanyards should be used;
- Permissible load and reach limitations should not be exceeded;
- Brakes should be set; outriggers used, if so equipped; and wheels chocked; if on an incline;
- Unless designed otherwise, aerial lift trucks should not be moved when the boom is elevated in a working position with workers in the basket;
- Upper and lower controls should be required and should be plainly marked. Lower controls should be capable of overriding the upper controls;
- Special precautions should be made to ensure the vessel and the lifting device are stable when aerial lifts are used on other vessels (for example barges, floats);
- Personal flotation devices (PFD) should be used when working over water;
- Caution should be taken for potential crushing hazards (for example booming into the overhead, pinch point).

The operation and training in the use of this type of equipment should be addressed by the Ships Safety Management System.

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5.2 Wire lift platform**5.2.1 Application**

Wire lift platforms may be used for inspection of structural members of ballast tanks, cargo oil tanks and cargo holds. Such equipment should be rated for more than one person and be operated by suitably authorised personnel. If carried on board and included in the Ship Structure Access Manual, the designer will have to take into consideration safety aspects associated with deployment and use of such means of access. The platform and equipment, including fixed points to the ships structure should be approved on behalf of the Administration being based on a recognised International or National Standard.

The following should be addressed for approval of the wire lift platform:

- accidental loss of balance;
- permissible weight;
- protection against overload;
- secondary means of escape;
- guard rails;
- permissible loads;
- permanent markings of the loads;
- recovery in the event of power loss.

5.2.2 Safety routines

Safety measures, including the following, should be taken by an authorised person prior to survey to the satisfaction of the attending surveyor(s):

- Lift controls, including safety devices and brakes should be serviceable and should be operated throughout the range prior to use. Operators should be trained.
- Rigging of wires should be in accordance with manufacturer's recommendations and conducted by qualified personnel.
- Fix points to which the wires will be connected should be examined before each use and verified in good condition (free of wastage, fractures).
- Permissible load limitations should not be exceeded.
- Personnel should work from within the lift basket.
- Body belts (such as harnesses) with lanyards should be used.
- Means should be provided for using fall protection with a lifeline that can be tended from above the platform.
- The maintenance of all equipment, the rigging of the equipment, its operation and training in use should be addressed by the Ships Safety Management System.

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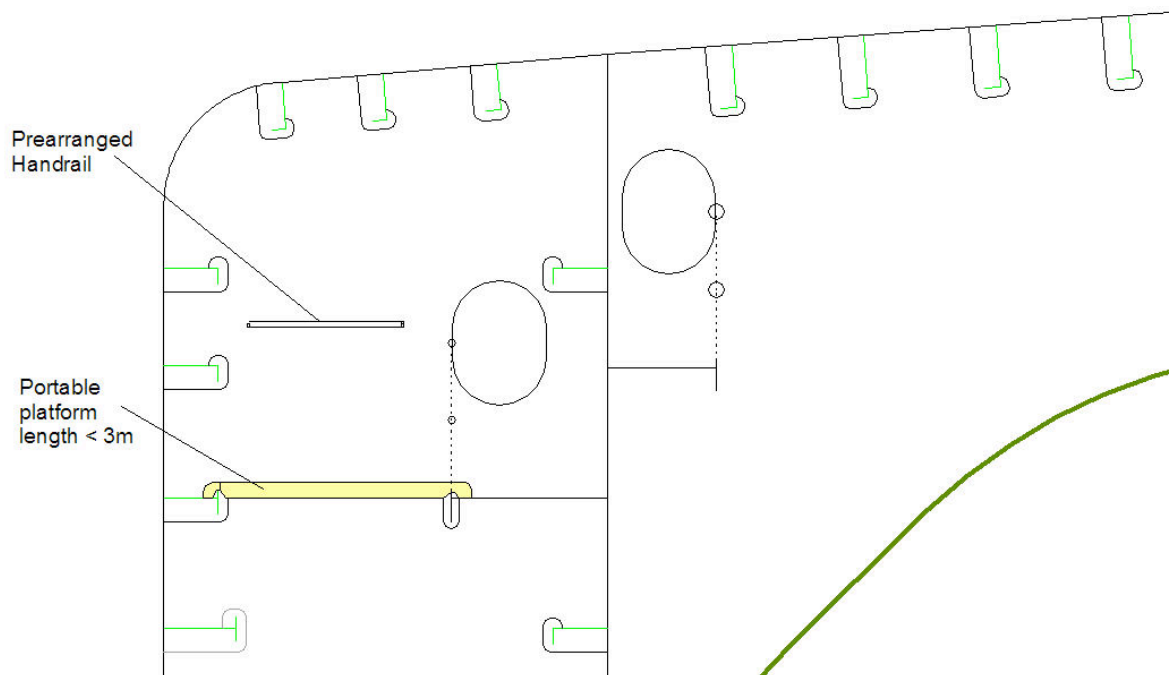
5.3 Portable platforms**5.3.1 Application**

Portable platforms not more than 3m length may be used for access between longitudinal permanent means of access and the structural member to be accessed. (see Figure 1.) Handrails should be provided, unless a safety harness is used in conjunction with the prearranged handgrips in way of the structure being accessed.

Portable platforms may be used as a portable means of access, provided that the platform and equipment, including fixed points to the ship's structure are specifically designed for the task and approved on behalf of the Administration based on a recognised International or National Standard.

Where portable platforms are included in the approved Ship Structure Access Manual, then the following should be considered prior to approval:

- permissible loads;
- permanent markings of the loads;
- fixing arrangements;
- guard rails;
- non skid construction.

**Fig.1 Portable Platform**

5.3.2 Safety routines

Safety measures, including the following, should be taken by the authorised person prior to survey to the satisfaction of the attending surveyor(s):

It should be ensured that portable platforms are safety secured and supported prior to use.

The maintenance of all equipment, the fixing of the equipment, its operation and training in its use should be addressed by the Ships Safety Management System.

5.4 Staging

5.4.1 Application

Staging is the most common means of access provided especially where repairs or renewals are being carried out. Staging is generally an option for access to any structural members to be surveyed and measured in tanks, holds and spaces but is NOT considered as an alternative to permanent means of access under TP Table 1 - 1.1.4 and Table 2 - 1.8. Staging not carried on board is not subject to approval as part of SOLAS II-1/3-6. In this case, Owner and/or provider of equipment are responsible for ensuring safety use.

Where staging and the associated equipment including its attachments to the ship's structure are specifically designed for survey and thickness measurement in accordance with SOLAS II-1/3-6, such staging should be approved on behalf of the Administration based on a recognised International or National Standard and necessary consideration is taken for the safety in the use.

5.4.2 Safety routines

Safety measures, including the following, should be taken by an authorised person prior to survey to the satisfaction of the attending surveyor(s):

Before working on or near any staging it should be ensured:

- a minimum of 6 evenly spaced suspension points - SWR or chains evenly spaced and as near vertical as possible;
- scaffold tubes are linked by right-angle couplers;
- an adequate working platform, fully boarded with toe boards and guard rails. Platform transforms (at 1.2m intervals) resting on ledgers (at 2.5m interval) and double transforms at platform board overlaps;
- the staging is level and provided with safe access (such as ladders);
- the staging is adequately decked (for example have a work surface and platform), and provided with guardrails;
- the staging is adequate for the work performed taking into account that falls are a significant hazard in site.

Where staging is approved as a part of the Ship Structure Access Manual and carried on board, the maintenance of all equipment, the rigging of the equipment, its operation and training in its use should be addressed by the Ships Safety Management System.

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5.5 Rafting**5.5.1 Application**

Rafting is generally used as term for surveys carried out by means of boats or rafts. Rafting may be an option for use in tanks, holds and spaces which may be filled with water provided the arrangement of internal structure is as described in this section. IACS Recommendation No.39 "Safe use of rafts or boats for survey" should be followed when rafting is specified for use in the Ship Structure Safe Access Manual as moveable means of access.

The structure arrangement should allow easy escape to deck from any position being rafted. At least 1.0m clearance above and 0.5m clearance beyond the breadth of the raft should be allowed for the safe passage passed any internal obstructions.

Bulk cargo holds

For bulk cargo holds designed for filling of water (e.g. ballast holds) and where filling up to a height not less than 2m below top of side frames is permitted (e.g. air draft holds), rafting may be utilized in lieu of permanent means of access to side frames (ref. TP Table 2 - 1.8) provided the structural capacity of the hold is sufficient to withstand static loads at all levels of water needed to survey the side shell frames. Refer to Z10.2 and Z10.5 for limitations on rafting of cargo holds.

Oil cargo tanks

Rafting of cargo tanks is subject to restrictions on discharging of water in harbour and weather conditions at voyage. Rafting as alternative means of access should therefore not be considered as "readily accessible" in oil cargo tank and do not provide an alternative to fitting of longitudinal permanent means of access as required by TP Table 1 - 1.1.4. Refer to Z10.1 and Z10.4 for limitations on rafting of cargo tanks.

5.5.2 Safety routines

Safety measures, including the following, should be taken by an authorised person prior to survey to the satisfaction of the attending surveyor(s):

It is the responsibility of the Owners to provide a raft that meets the requirements of IACS Recommendation No.39.

The organisation for the surveys by the means of rafting, its operation and training in use should be addressed by the Ships Safety Management System.

5.6 Portable Ladders**5.6.1 Application**

Portable ladders may be used for access to any structural members as supplementary and/or additional to permanent means of access in accordance with SOLAS II-1/3-6 and should be included in the Ship Structure Access Manual.

The requirements of IACS Recommendation No.78 "Safe Use of Portable Ladders for Close-up Surveys" should be used when specified for use in the Ship Structure Safe Access Manual as a portable means of access.

Portable ladders should be designed based on a recognised International or National Standard. The rungs and steps of portable ladders should be designed to minimise slipping, e.g. corrugated, knurled, dimpled or coated with skid resistance material.

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Step ladders, hanging ladders and ladders more than 5m long may only be utilized if fitted with a mechanical device to secure the upper end of the ladder.

In accordance with IACS UR Z10.2, paragraph 5.3, the use of a portable ladder fitted with a mechanical device to secure the upper end of the ladder is acceptable for the "close up survey of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of the side frame at side shell and side frame end attachment and the adjacent shell plating of the forward cargo hold" at annual Survey, required in 3.2.4.1.b, and the "one other selected cargo hold" required in 3.2.4.2.b.

5.6.2 Safety routines

Safety measures, including the following, should be taken by an authorised person prior to survey to the satisfaction of the attending surveyor(s):

See IACS Recommendation No.78 "Safe Use of Portable Ladders for Close-up Surveys"

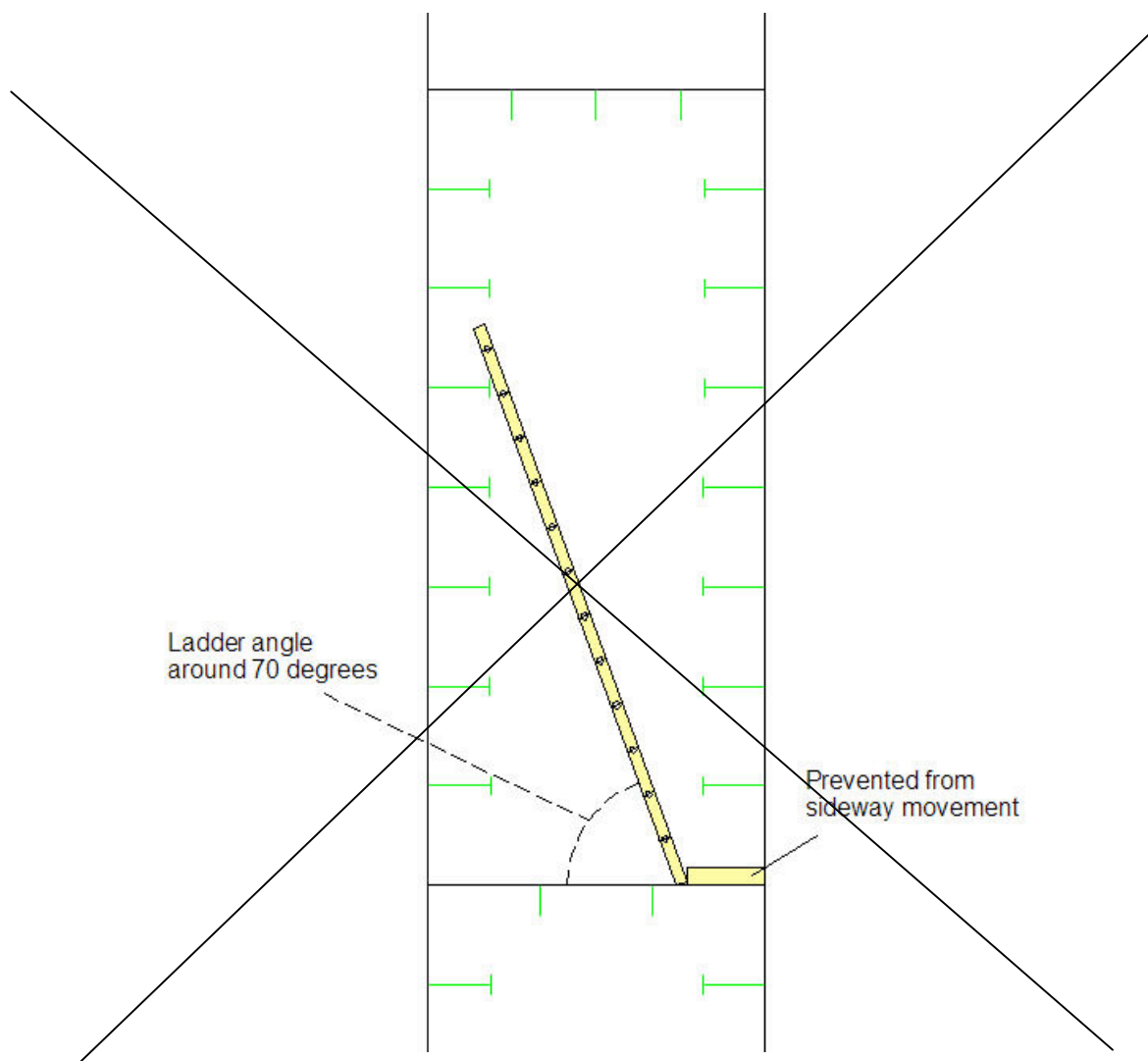
The feet of portable ladders should be prevented from slipping during use by securing the stiles at or near their upper and lower ends, by any anti-slip device or by other arrangements of equivalent effectiveness. Unless otherwise specified in a specification of each portable ladder or relevant safety standards, the ladder should be in general raised at an angle of around 70 degrees to the horizontal. (~~See Figure 2.~~)

Portable ladders should be used on top of bottom or deep stringer platform so that the free falling height does not exceed 6m. If it is necessary to exceed this height, there should be at least 3m of water above the highest structural element in the bottom to provide a "cushion" or a safety harnesses to be used. The free falling height above the water surface should not exceed 6 metres.

When climbing ladders in tanks containing water, the surveying personnel should wear "flotation" aids. A flotation aid is a simple form of lifejacket which does not impede climbing or a self-inflatable lifejacket.

Aluminium ladders may be used in cargo tanks, but can not be stored in the cargo area or other gas dangerous spaces.

The maintenance of all equipment, the securing of the equipment, its operation and training in use should be addressed by the Ships Safety Management System.

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(cont)**Fig.2 Use of Portable Ladder****5.7 Innovative approach**

Any proposal for innovative means of access should be trialed outside the mandatory requirements of the SOLAS regulation II-1/3-6 and should not be accepted as meeting this regulation until accepted by the IACS Survey Panel.

IACS Members should, through the Survey Panel, advise IACS Secretariat of any new solutions/designs evaluated. The Secretariat should keep a register of innovative designs. If accepted by the IACS Survey Panel then the arrangements may be accepted as an alternative means of access provided that all the criteria from the trials are included into the design.

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