



**Subject:** Considerations when using Lloyds SSC software

**General:** Lloyds register make available the Lloyds Register Special Service Craft (SSC) software for the public. This software makes the calculation of scantlings simpler. However, the software does not provide an exhaustive list of the requirements for the plan approval of a vessel.

This instruction to surveyors (ITS) expands on **some** of the more common requirements stipulated in the Lloyds Register SSC rules that are **not** incorporated in the SSC software outputs.

Additionally this ITS references rules contained in Part 7 of the SSC rules, for vessels constructed in Aluminium. However, most of these requirements are transferable across material types. For example, similar provisions for vessels built in steel are contained in Part 6 etc. Surveyors should verify and amend as necessary the SSC outputs for these materials, by reading the applicable Lloyds register SSC chapters.

Some terms in the text below have been paraphrased so that the context is correct.

**Aesthetics & Acceptance Criteria for Workmanship**

***Part 7, Chapter 1, Section 2, Clause 2.2 specifies that:***

*The National Regulator is not concerned with the aesthetics or appearance of the craft; the responsibility for such matters remains with the Builders and/or designers to ensure that the agreed specification is complied with. The National Regulator is however concerned with the quality of workmanship. In this respect the acceptance criteria as required by the Rules are to be complied with.*

The design acceptance criteria for LR SSC rules are contained mostly in Part 3, Section 7 of the SSC rules. This part of the SSC is not directly called up by NSCV part C3. Nonetheless *Part 7, Chapter 1, Section 2, Clause 2.2* refers to these acceptance criteria and this section should be referenced when discussing workmanship with a builder.

**Works inspection and quality control**

***Part 7, Chapter 2, Section 1, Clause 1.5 & 1.6 specify that:***

Prior to the commencement of construction, facilities are to be inspected to the satisfaction of the attending Surveyor. This includes verification that the minimum quality control arrangements outlined in *Pt 7, Ch 2, 1.6 Quality control* have been implemented

The extent and complexity of the quality systems, will vary considerably depending on the size and type of craft and production output.

The National Regulator will accept any of the following as evidence of compliance:

- QA system certified in accordance with a national or international system (ISO 9001 etc); or
- LR quality assurance scheme; or
- locally accepted quality control system.

***Locally accepted quality control system***

A locally accepted quality control system should include documented controls for the following;

- Receipt, storage and issue of materials & equipment;
- Fabrication environment;
- Weld Procedures and welder performance (see ITS 008 - Welding To AS 1665:2004);
- Production fabrication;
- Inspection of production processes;
- Installation of machinery and essential systems;
- Fitting out;
- Tests and trials;
- Drawings and document control;
- Records.

Generally the QC system specified in SSC rules, requires the builder to have a written procedure that describes clearly and unambiguously:

- how each activity specified above will be carried out,
- when it is carried out; and
- by whom.

**Inspection and responsibility for inspection**

***Part 7, Chapter 2, Section 1, Clause 1.11 species:***

***Builders responsibility***

It is the Builders responsibility to carry out required inspections in accordance with their quality control system, as verified / accepted by the surveyor.

Adequate facilities are to be provided to enable the surveyor to carry out a satisfactory inspection and to facilitate subsequent in-service maintenance. These are to include the provision of access holes in restricted spaces and removable deckhead and shipside linings, cabin soles, etc

***Surveyors responsibility***

It is the Surveyors responsibility to monitor the builder's quality control records and carry out inspections at agreed key stages and during periodic visits.

***Deviations***

All deviations are to be dealt with in accordance with the accepted quality management system (See works inspection and quality control).

Proposed deviations from the approved plans are subject to accredited surveyor approval and in the first instance are to be discussed with the attending surveyor. Such deviations are to be brought to the attention of the accredited surveyor who conducted the plan approval and may require re-approval of the affected plan(s).

**Paints and Coatings**

***Part 7, Chapter 2, Section 2, Clause 2.6 species that:***

The hull, deck, deckhouse and superstructure and other structure which is exposed to the marine environment is to be protected against corrosion by a suitable protective coating.

Internal structures need not be coated provided they are built of a suitable grade aluminium alloy.

Aluminium alloy is to be suitably cleaned, cleared of oxide and degreased before the application of any protective coating.

Paints containing lead, mercury or copper are not to be used in conjunction with aluminium alloys.

**Deck Coverings**

***Part 7, Chapter 2, Section 2, Clause 2.9 species that:***

Where plated decks are sheathed with wood, the sheathing is to be efficiently attached to the deck, caulked and sealed, to the satisfaction of the surveyor, in accordance with the approved drawings.

***Additionally Part 7, Chapter 2, Section 4, Clause 4.27 species that:***

To minimise corrosion of aluminum when in contact with timber, the timber is to be primed and painted in accordance with good practices. Alternately the aluminum in contact with the timber is to be coated with a substantial thickness of a suitable sealant.

Timbers such as western red cedar, oak and chestnut are not to be directly in contact with aluminum unless well seasoned . Timber preservatives such as copper naphthanate, copper-crome-arsenate and borax-boric acid should be avoided.

**Doubler plates**

***Part 7, Chapter 2, Section 4, Clause 4.18 species that:***

Doubler plates are to be avoided in areas where corrosion may be a problem and access for inspection and maintenance is limited.

Where doubler plates are fitted, they are to have well radiused corners and the perimeter is to be continuously welded. Large doubler plates are also to be suitably slot welded, the details of which are to be submitted for consideration.

**Scantlings for unusual or very fast vessels**

There is a general limitation on the use of SSC rules for unusual or very fast craft.

***Part 7, Chapter 3, Section 1, Clause 1.3 species that:***

Where a craft is of unusual design, form or proportions, or where the speed of the craft exceeds 60 knots the scantlings are to be determined by direct calculation.

The requirements of this Chapter may be modified where direct calculation procedures are adopted to analyse the stress distribution in the primary structure.

**Pilot craft*****Part 7, Chapter 3, Section 3, Clause 3.6.5 species that:***

For pilot craft which may be subject to repeated impact loadings from contact with other craft etc, the sheer strake plating is to be increased locally by not less than 50 per cent of the side shell thickness. The increased thickness is to extend from the bow aft over a distance of 0,33 L R or 500 mm aft of the point which the deck line reaches its greatest breadth, whichever is the greater and forward of the quarter and over the transom for a distance of 0,075 L R or 1,0 m, whichever is the greater. In general it is to extend from the deck edge to below the first longitudinal stiffener, or a vertical distance equivalent to 1/3 the freeboard height whichever is the greater. The additional thickness is then to be tapered out to the side shell thickness in accordance with the Rules.

***Part 7, Chapter 3, Section 4, Clause 4.18.1 & 4.18.2 specify that:***

Pilot craft are to be fitted with large knees in way of the sheer strake in areas as indicated in Part 7, Chapter 3.6. The knees are to be aligned between the transverse frames and the deck beams. In the case of longitudinally framed craft, intermediate knees are to be fitted with a spacing in general not greater than 500 mm. Where such intermediate brackets are fitted they are to terminate on a side longitudinal with a section modulus of, in general, twice that of the Rule longitudinal for the web frame spacing, and a deck longitudinal. The side longitudinal is to be positioned below any fendering to carry the heel of the knee. Consideration will be given to the termination of such brackets by use of a 'soft-toe' in way of the deck. The thickness of the webs for these knees is to be twice that required by Part 7, Chapter 3, 1.21.

**Fishing craft*****Part 7, Chapter 3, Section 3, Clause 3.6.6 species that:***

Fishing craft, are in general, to have their shell plating scantling as required to satisfy the Rule loadings, increased by 20 per cent. Additionally, the side shell is not to be taken less than as bottom shell thickness, and where there are gallows, gantries, nets, or lines etc. the plating in way is to be further increased locally and/or suitably protected by sheathing or other means.

***Part 7, Chapter 3, Section 4, Clause 4.18.1 & 4.18.3 specify that:***

Fishing craft engaged in pair trawling and other modes of fishing, and which may be subject to repeated impact loading from contact with the other craft, are to have additional stiffening fitted in way of the impact areas. This may be in the form of large knees, intermediate knees, substantial fendering/ rubbing strakes.

**Chines (generally)*****Part 7, Chapter 3, Section 3, Clause 3.7 species that:***

The chine plate thickness is to be equivalent to the bottom shell thickness required to satisfy the Rule pressure loading, increased by 20 per cent, or 6 mm, whichever is the greater.

Where tube is used in chine construction, the minimum wall thickness is to be not less than the thickness of the bottom shell plating increased by 20 per cent.

Full penetration welding of shell plating in way of chines is always to be maintained.

**Sea inlet boxes*****Part 7, Chapter 3, Section 4, Clause 3.12 species that:***

The thickness of the sea inlet box plating is to be 1 mm thicker than the adjacent shell plating, or 8 mm, whichever is the greater.

**Crane support arrangements*****Part 7, Chapter 5, Section 2, Clause 2.6 species that:***

Crane pedestals are to be efficiently supported and in general, are to be carried through the deck and satisfactorily scarfed into the surrounding structure. Alternatively, crane pedestals may comprise a foundation, in which case the foundation and its supporting structure are to be of substantial construction. Proposals for other support arrangements will be specifically considered.

The proposed arrangement, is to be designed with respect to the worst possible combinations of loads resulting from the crane self-weight, live load, wind and crane accelerations, together with those resulting from the craft's heel and trim. Plans submitted for the proposed foundation by the designer must include / incorporate design calculations covering these load cases.

Insert plates are to be incorporated in the deck plating in way of crane foundations. The thickness of the insert plates is to be as required by the designer's calculations but is in no case is to be taken as less than 1,5 times the thickness of the adjacent attached plating.

All inserts are to have well radiused corners and be suitably edge prepared prior to welding. All welding in way is to be double continuous and full penetration where necessary. Tapers are to be not less than three to one.

**Propeller  
ducting**

***Part 7, Chapter 5, Section 2, Clause 2.11 species that:***

Where propellers are fitted within ducts/tunnels, the plating thickness in way of the blades is to be increased by 50%. The tunnel wall in way of the propeller blades is to be additionally stiffened.

**Contact:**

DCVSurvey@amsa.gov.au