

## 关于实施 IACS 统一要求 URZ23 新造船船体检验的通告

各有关船厂、船东、船舶设计单位：

国际船级社协会(IACS)于 2006 年 7 月制定了统一要求 URZ23 “新造船船体检验”，该要求适用于 2008 年 1 月 1 日及以后签订建造合同的船舶。我社《钢制海船入级规范》2007 修改通报已纳入此要求。

### 一、制定和实施 URZ23 的目的：

- 1、制定关于新造船船舶检验的全面统一要求，作为各个船级社船级及法定证书签发过程的组成部分，验证船舶符合相关规范、规则的要求。
- 2、在船级检验、法定检验、IACS 统一要求、IMO 制定的 GBS 草案间建立联系，旨在确保船级社规范、相关法定要求、统一解释(UI)在船厂及其分包方处得到清楚、全面和统一的实施。
- 3、确保各个成员船级社规范及相关法定要求的检验项目得到全面覆盖。

### 二、URZ23 的适用范围：

2006 年 8 月，IACS 理事会批准颁布该统一要求，本要求适用于 2008 年 1 月 1 日及以后签订建造合同的入级国际航行钢质海船。

### 三、URZ23 的主要内容：

- 1、船体结构检验范围：在船厂或者其分包方建造的钢质海船（500 总吨及以上）；
- 2、检验方式的定义：现场巡检、文件复核和现场见证（参与检验与试验）；
- 3、船体结构的检验：表 1(Table1)列出了造船流程、船级与法定检验项目和要求、检验方式、相应的船级和法定参考文件、建造过程中需要提供给验船师的资料和记录等。同时，船厂需要提供证据，表明安装上船的材料和设备，其制造与安装满足相应的规范和法定要求；
- 4、对船舶建造厂的评估：

- 1) 验船师需要在如下标明的船舶建造开始前, 评估船厂设施和管理, 目的是在随后的检验过程中, 予以关注或特别检验, 如——船级社不了解或近期不了解的船厂、船厂设施有了根本性改变(增加了新的船台或船坞)、船厂管理结构和体系根本性改变(新的所有权或管理机构)、船厂建造完全不同的船舶(货船到化学品船、液化气船等)。
  - 2) 评估的具体要求见本社建造处 011 通函。
  - 3) 应注意到, 建造设施评估并不是对造船厂(或分包方)的造船质量进行评估, 而是通过对船舶建造流程的评估, 协助验船师如何更好的执行后续检验和处理可能出现的问题;
- 5、验船师的资质和监控: 船级社应使用专职验船师从事建造检验, 验船师应具备相应的资质, 同时应制定相应的程序使其受到监控;
- 6、检验策划和开工会议:
- 1) 在任何新造船项目开始之前, 船级社与船厂间应召开开工前会议(Kick-off Meeting), 目的是就表 1 的各项具体活动如何进行检验达成一致, 审查和确定船体结构的建造质量标准(IACS REC 47 或者船级社已经认可的建造标准)。在首次会议中需注意特定的、已经出版的主管机关要求和法定统一解释。
  - 2) 应完成基于表 1(Table1)内容的会议记录, 会议记录应随着造船过程的进展根据情况变化而不断变化。应注意到: 船厂需要同意当出现质量问题时进行调查、调查过程需要通知验船师, 如果缺陷的程度严重, 原则上调查期间不允许继续施工。
  - 3) 对于系列船舶和船级社一直在船厂工作情况下, 首次会议内容可适当简化, 主要关注法定新要求、前期设计改变、关键建造节点等方面。无论如何, 船级社都要保持表 1 的要求得到实施。
- 7、新造船检验和试验的计划:
- 1) 包括结构完工检查方案; 必要时, 结构装配检查方案; 结构试验及水密、风雨密关闭设施的试验方案; 无损探伤方案; 其他特定的检查和试验方案等。
  - 2) 有关计划和变更, 及时通知验船师以便有足够的时间进行批准。
- 8、检验符合性的证据: 船级社应提供证据(检查项目表、检验记录、报告

以及要求的有关文件等), 表明验船师已经按照检验策划的要求参加了船厂检验和试验计划中的项目, 并在审核时提供相关记录。这种审核应是由法律、公约或 IACS 授权的责任机构进行的。

#### 9、船舶建造档案:

- 1) 造船厂应提供船舶建造档案, 其目的为了方便船舶今后检查、修理和维护, 保证技术要求的连续性。
- 2) 船舶建造档案主要包括船舶结构图纸、焊接细节和要求、ESP 船舶需要近观检查范围内的结构节点、船级和法定要求的各种手册、铸锻件产品证书、进坞和下水检验细节布置、水密完整性设备布置和水密/油密舱室试验记录、船舶防腐措施和涂层技术档案等等。
- 3) 如果船东或其他方自行订货, 文件的提供由其自行负责。

#### 四、对表 1(Table 1)的要点解释

##### 1、表 1 结构

###### 1) 横向——项目说明

船舶建造流程、船级检验要求、船级社检验方式、IACS/法定参考要求、建造期间验船师能够得到或看到的文件、船舶建造档案要求、具体的检验要求, 特别注意需要结合首次会议结果和船厂评估发现的薄弱环节

###### 2) 纵向——造船流程

焊接:

包括了焊接材料、焊工资质、焊接工艺与规格、焊接环境、焊接表面和内部缺陷检查等要求;

钢材处理与装配:

包括了钢材表面处理/标示/切割、钢材矫正、钢材成型、结构定位与装配、关键位置的定位与装配等要求;

钢质结构施工:

包括部件和分段组装、分段合拢和船台/船坞合拢等要求;

超差修理与变更要求;

强度与密性试验要求;

防腐系统检验要求;

设备的安装检验要求:

包括舱口盖、门与跳板、舵、铸锻件、船舶附体如导流管等、保障水密完整性的附件如船壳上的阀/空气管/通风筒等；

干舷勘划与吃水标志；

构造安全要求等。

- 2、表格使用：该表格为电子版，目的是验船师结合船厂评估、首次会议等要求，提出针对性检验要求和要求船厂改进的措施，以便在建造过程之中落实。该表格将作为本社质量记录之一，予以编写、更新和保存；
- 3、需要关注以下在过去没有要求或者要求不具体的事项：
  - 1) 焊接材料与本社认可清单的对应，需要持有本社焊接材料认可清单，如产品录电子版；
  - 2) 船厂保存、管理焊接材料的流程与规定，焊接材料使用能够可以追溯；
  - 3) 批准的焊接工艺和要求得到了遵守，特别注意船厂工作场所是否保持了这些资料；
  - 4) 焊接设备的确认：参数设定是否符合批准工艺要求、其装设的仪表是否由具备资格的人员，按照计划进行了定期性验证、验证是否按照制造商要求进行；
  - 5) 焊接环境要求：如焊接处所的保护、焊前/焊后保护措施、保护气体和保护焊剂正确使用等等；
  - 6) 船厂焊接监控是否有效；
  - 7) NDE 计划不仅仅包括内部缺陷检查如 X 射线和 UT, 还要包括焊缝表面缺陷检查部位和相应验收标准要求，如自动焊拼版对接焊缝表面检查；
  - 8) 验证焊缝内部缺陷检查记录，还包括确认灵敏度、NDE 设备效验等符合有关检测要求；
  - 9) 材料流程与控制：

材料的堆放与存储要求、材料标识和流程的记录以利于追溯、材料切割的机器误差标准、材料级别标识与零部件的存贮和使用流程控制、确认材料加工工艺符合标准要求、变形校正的温度控制等等；
  - 10) 结构装配符合标准要求，工作场所配备认可的建造误差标准，并能够得到最新的批准图纸和资料；

- 11) 修理与变更记录保存并可以追溯;
- 12) 确认舱壁和船壳上门及跳板的使用、维护保养手册已经纳入船舶建造档案;
- 13) 舵系安装与间隙等记录已经纳入建造档案;
- 14) 载重线勘划记录已经纳入建造档案;
- 15) 载重线勘划涉及的所有设备和材料证书已经纳入建造档案;
- 16) 船舶吃水标志勘划、主尺度测量记录已经纳入建造档案, 注意船旗国是否有吃水标志的勘划误差标准的特殊规定, 等等。

五、URZ23 表 1 船体结构检验项目的要求 (附件 1)

六、URZ23 原文 (附件 2)

七、上述文件可登录CCS网站[www.ccs.org.cn](http://www.ccs.org.cn)首页规范规则动态中的《钢质海船入级规范 2007 修改通报》或在IACS网站[www.iacs.org.uk](http://www.iacs.org.uk)查询下载。

**特此通告!**

中国船级社建造入级处

Tel: +86-010-58112461

Fax: +86-010-58112897

Email:md@ccs.org.cn

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>①</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
	造船质量控制流程								
1	焊接								
1.1	焊接材料	制造厂得到 CCS 工厂认可	审查认可状态以及巡检，按制造厂要求验证其储存、操作和处理	《材料与焊接规范》第 3 篇第 2 章		焊接材料规格和认可状态	无要求	对照认可清单，确认焊接材料	
								验证临时和永久储存设施	例如：保持干燥，封盖、烘焙
								验证追溯性	例如：随机批号核查
1.2	焊工资格	合格焊工	审查焊工证书和巡检	IACS Rec.47		具有身份证明的船厂记录	无要求	验证焊工资质标准，如等级或公认标准	
								验证焊工符合其认可焊接位置	
								验证焊工证书有效期	
1.3	焊接 – 机械性能（焊接工艺）	所有结构焊接接头形式、位置和材料都应符合	审查和巡检	《材料与焊接规范》第 3 篇第 3 章和第 5		与船舶或过程有关的经认可的焊接工艺、规格和焊接规格表	无要求	按规范或公认的标准，验证焊接工艺记录业经认可并覆盖所有焊接过程和位置	

<sup>①</sup> 本表所列的 IACS REC.不作为强制要求，IACS UI 见《法定要求实施指南（国际航行）》。

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
		CCS 认可的焊接工艺要求		章					
		只要 CCS 在船厂进行检验，CCS 见证所有新的焊接工艺认可试验。						验证在相关工作场所可获得焊接工艺	
								验证焊接工艺能使验船师获得参考	
1.3a	焊接设备	正确校准和维护	巡检和审查			船厂维护以及校准记录	无要求	验证焊接机械和设备的状况	
								验证机械经合适人员校准	
								验证按制造商建议进行校准	
								验证按维护周期进行校准	
1.3b	焊接环境	满意环境	巡检	IACS Rec.47			无要求	验证焊接区域干净、干燥、良好光照	
								确认所采取相关焊前或焊后热处理、焊前表面干燥的措施	
								确认焊接保护气体、焊丝是否防护	
1.3c	焊接监督	具有足够数量的熟练监督员	巡检	IACS Rec.20 和 Rec.47				确认监督有效性	

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序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
1.4	焊接--表面缺陷	无明显的缺陷,焊缝成形和尺寸良好	外观检查、表面探测方法、审查文件和对操作者巡检	IACS Rec.20和 Rec.47		船厂和公认标准以及规范(如适用),焊接和无损检测计划,无损检测报告	无要求	确定无损检测部位:平板对接焊缝、铸件与船体结构连接缝	
								验证按批准的适用计划进行无损检测	
								验证无损检测方法的适宜性	
								验证操作者具有适当资质(特别是雇佣分包方时)	
								验证按可接受程序进行无损检测	
								审查无损检测记录	
1.5	焊接-内部缺陷	有资质的操作者进行无损检测,能够确保无显著的重大缺陷	对 X 射线和超声波探伤、审查文件以及操作者巡检、检查 X 片	IACS Rec.20和 Rec.47		船厂和公认标准以及规范(如适用),焊接和无损检测计划,无损检测报告、操作者资质证明	无要求	确定无损检测部:平板对接焊缝、铸件与船体结构连接缝	
								验证按认可的适用计划进行无损检测	
								验证无损检测方法适宜性	
								验证操作者具有适当资质(特别是雇佣分包方时)	

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序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
								验证记录业已完成并符合公认标准，如：像质计（IQI）以及记录的敏感度	
								验证船厂已正确评价报告和X光照片，验船师系统地审查X光照片。	
								验证设备校准满意并符合制造商和公认标准要求	
								验证无损检测（NDE）符合可接受的程序	
2	钢材预处理和装配								
2.1	表面处理、标记和切割	材料的可追溯性和可接受性，检查钢板和型材、材料类型、构件尺寸标识以及试验标记	巡检	IACS Rec.47		材质证书，在加工场所的标记/切割加工文件（在船厂设施保留的文件）	无要求	验证堆场贮存令人满意	
								验证材料可追溯性，如：对照材质证书、归档记录核查钢印	
								验证处理后标记转移	
								验证喷砂和车间底漆的标准	

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								验证车间底漆的适宜性	
								验证钢板级别能予以识别	
								验证机器调整保持在 IACS 或制造商建议的范围内	
								验证标记和切割的精确性	
								验证部件/组件的存储状况	
2.2	矫正	变形矫正方法/ 程序的批准	巡检和审查	IACS Rec.47		公认标准、认可程序	无要求	验证用于该级别和类型钢板的矫正程序得到批准，如温度-形变控扎板（TMCP），Z 向钢板	
								验证板材和型材在公认的公差范围内	
2.3	成型	保持材料性能， 接受避免不适当变形的成型方式	巡检	IACS Rec.47		船厂的热加工成型程序	无要求	验证操作者的温度控制	
								当进行特殊钢材和材料成型加工时，验证可获得的温度控制的适宜方法	
								验证成型过程可接受性	
2.4	定位、装配及其间隙标准的符合性	针对引用标准， 检查定位、装配	巡检	IACS Rec.47		适用的船厂标准和公认标准，以及规范	无要求	验证各过程以保证所有工作场所装配和定位满意	

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		及其间隙							
								验证装配过程中被切割的焊接接边得到重新加工	
								验证修补程序得到实施，以纠正过大装配间隙和定位偏差	
2.5	关键区域的定位/装配或焊接结构的符合性	按批准的图纸，检查定位/装配/间隙	巡检和审查	IACS Rec.47		适用的船厂标准和公认标准、以及规范、批准图纸或标准、船厂的记录	关键区域的批准布置（如适用）	验证在工作场所能获得与最新有效的批准图纸有关的资料	
								在各工作场所，验证加工程序得到遵循，以确保满意的装配和定位	
								验证装配过程中被切割的焊接接边得到重新加工	
								验证修补程序得到实施，以纠正过大装配间隙和定位偏差	
3	船体结构建造过程，如部件组装，小分段、中分段和大分段组装，分段预合拢和合拢，工艺孔处的封板	与批准图纸的符合性、焊接和材料的外观检查、定位和变形核查	过程的巡检和完成项目的现场见证	IACS Rec.47		批准的图纸、船厂检查记录、船厂和公认的标准，以及适用的规范，建造计划（钢结构分段）		验证在工作场所能获得与最新有效的批准图纸有关资料	

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
								验证采用正确焊缝规格	
								验证在不同的工作阶段焊接过程操作满意	
								验证部件标识	
								验证安装在公认的公差内	
								验证本表第 1 项（焊接）正确焊接要求得到实施	
								验证工艺孔封板等程序的可接受性	
								确认分段符合批准图纸	
4	修补工作以及变更	焊接，检查变形和定位	审查记录和现场见证	IACS Rec.47		船厂检验项目的永久记录		验证不符合批准图纸的重大偏差已得到记录和保存，如错开口，重新装配	
								验证所有由船厂通知验船师的偏差是否可接受	
5	密性试验，包括渗漏和冲水试验，静水压气动试验	无渗漏	过程巡检和现场见证试验	本规范第 1 篇第 4 章第 3 节	经修改的 SOLAS 第 II-1/14 条	批准的舱室密性试验计划、船厂检查记录	批准的舱室密性试验计划	确认舱室密性试验符合批准的图纸	
								确认渗漏试验的方法	
								确认保持的渗漏、冲水和静水压和静水压气动试验压力符	

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
								合要求	
								验证适当的液舱试验记录是否得到保存	
6	结构试验	结构设计的适合性	现场见证试验	本规范第 1 篇第 4 章第 3 节	经修改的 SOLAS 第 II-1/14 条	批准的舱室密性试验计划、船厂检查记录	批准的舱室密性试验计划	确认舱室密性试验符合批准的图纸	
								确认试验保持的压力符合要求	
								验证适当的液舱试验记录是否得到保存	
7	防腐系统如：涂层，阴极保护，外加电流	由船壳和舱壁组成边界的海水压载舱	审查和报告船厂和制造厂的文件	本规范第 2 篇第 1 章第 6 节、UISCI22	经修改的 SOLAS 第 II-1/3-2 条	制造厂和船厂的说明书	防腐保护说明书	验证施用的涂层经过认可并审查涂装记录	
								验证保持有足够的记录并在船舶档案保存其副本	
8	以下各项的安装、焊接和试验								
8.1	舱口盖	密性和锁紧	现场见证	本规范第 1 篇第 4 章第 3 节和 IACS Rec14	66 载重线公约的第 13, 14, 15, 16 条	批准的舱室试验图，船厂检查记录	详细要求、结构图纸	确认舱口盖的渗漏试验	

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
								确认操作和锁紧试验	
8.2	船壳和舱壁上的门和跳板	密性和锁紧	现场见证	本规范第 1 篇第 4 章第 3 节	经修订的 SOLAS 第 II-1/18 条, 66 载重线公约的第 12, 21	批准的舱室试验图, 船厂检查记录	详细要求	确认渗漏试验	
								确认操作和锁紧试验	
								确认安全装置操作	
								保证正确的维护记录/手册提 供给船厂建造档案中	
8.3	舵	安装	现场见证	本规范第 1 篇第 4 章第 3 节		批准图纸、船厂检查记录	详细要求、 结构图	确认与舵柄的定位与安装	
								确认功能试验	
								验证舵销装配和所有的紧固 螺栓	
								验证所有装配记录, 包括保持 并纳入船舶建造档案的间隙	
8.4	锻件和铸件	符合批准图纸、 焊接和材料的外观检查, 检查定 位和变形	过程巡检和完成 项目的现场见证	《材料与焊接 规范》第 5 章 和第 6 章		批准图纸、船厂检查记录、 船厂和公认标准, 以及适 用的规范、建造计划 (分 段结构划分)	锻件和铸 件证书的 副本	对照材料证书, 验证锻件和铸 件	

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议	
								验证采用本表 1.2.4 和 1.2.5 规定的正确焊接和安装要求		
								验证材料证书已纳入船舶建造文档		
	船舶附体							验证采用本表 1.2.4 和 1.2.5 规定的正确焊接和安装要求		
8.5	组成水密和风雨密完整性的设备如：舷外排放、空气管、通风筒	密性和锁紧	现场见证		经修改的 SOLAS 第 II-1/19 条以及 1966 载重线公约第 17-18-19-20-22-23 条	批准的舱室试验图，船厂检查记录	详细要求	验证采用本表 1.2.4 和 1.2.5 规定的正确焊接和安装要求		
								验证符合经修定的 1966 载重线公约，即所有舾装符合干舷核定记录		
				本规范第 3 篇第 2 章附录 4					验证空气管、通风筒等关闭装置是认可型	
									验证舷外排放装置的材料证书	
									验证干舷核定记录和所有材料证书纳入船舶建造文档	
	干舷和吃水标志	在容许公差范围内，并符合干舷	现场见证	UI-LL4	载重线公约第 4、5、6.7、和		详细要求	验证干舷标志符合载重线勘划要求		

表 1.新造船船体检验要求

序号	造船流程	船级检验要求	船级检验方式	规范和IACS <sup>®</sup> 要求	法定要求与有关文件	建造中需向验船师提供的文件	船舶建造档案文件	具体活动	项目建议
		布置。			8 条				
								验证吃水标志符合同意的船厂规定公差，除非船旗国有要求	
	主尺度	在容许的公差范围内	审查和现场见证	IACS Rec.47			详细要求	验证主尺度偏差符合公认标准	
								验证船舶尺度已纳入船舶建造文档	
	构造安全证书	无遗留或缺陷	现场见证		经修改的 SOLAS 第 I/10 条			验证船体结构方面的主管机关要求已得到满足。	

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**Hull Survey for New Construction****1. Scope**

The scope of this UR includes the following main activities:

- 1.1 Examination of the parts of the ship covered by classification rules and by applicable statutory regulations for hull construction, to obtain appropriate evidence that they have been built in compliance with the rules and regulations, taking account of the relevant approved drawings.
- 1.2 Appraisal of the manufacturing, construction, control and qualification procedures, including welding consumables, weld procedures, weld connections and assemblies, with indication of relevant approval tests.
- 1.3 Witnessing inspections and tests as required in the classification rules used for ship construction including materials, welding and assembling, specifying the items to be examined and/or tested and how (e.g. by hydrostatic, hose or leak testing, non destructive examination, verification of geometry) and by whom.
- 1.4 Appraisal of material and equipment used for ship construction and their inspection at works is not included in this UR. Details of requirements for hull and machinery steel forgings and castings and for normal and higher strength hull structural steel are given in W7, W8 and W11 respectively. Acceptance of these items is verified through the survey process carried out at the manufacturer's works and the issuing of the appropriate certificates.

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Note: This UR is to be uniformly implemented by IACS Societies on ships contracted for construction on or after 1 January 2008.

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**2. Definitions\***

- 2.1 The hull structure is defined as follows:
- a) hull envelope including all internal and external structures,
  - b) superstructures, deckhouses and casings,
  - c) welded foundations, e.g. main engine seatings,
  - d) hatch coamings, bulwarks,
  - e) all penetrations fitted and welded into bulkheads, decks and shell,
  - f) the fittings of all connections to decks, bulkheads and shell, such as air pipes and ship side valves – all ILLC 1966, as amended, items.
  - g) welded attachments to shell, decks and primary members, e.g. crane pedestals, bitts and bollards, but only as regards their interaction on the hull structure.
- 2.2 Reference to documents also includes electronic transmission or storage.
- 2.3 Definition of survey methods which the surveyor is directly involved in: Patrol, Review, Witness
- 2.3.1 Patrol, the act of checking on an independent and unscheduled basis that the applicable processes, activities and associated documentation of the shipbuilding functions identified in Table 1 continue to conform with classification and statutory requirements.
  - 2.3.2 Review, the act of examining documents in order to determine traceability, identification and to confirm that processes continue to conform with classification and statutory requirements
  - 2.3.3 Witness, attendance of scheduled survey items as defined within the shipbuilding functions

**3. Applications**

- 3.1 This UR covers the survey of all new construction of steel ships intended for classification and for international voyages except for:
- a) those defined in SOLAS I/3
  - b) high speed craft as defined in I/1.3.1 of the 2000 High Speed Craft Code
  - c) Mobile Offshore Drilling Units as defined in I/1.2.1 of the MODU Code

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\* Footnote: Terminology for hull terms and hull survey terms can be found in Recommendation 82.

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- 3.2 This UR covers all statutory items, relevant to the hull structure, i.e. Load Line and SOLAS Safety Construction.
- 3.3 This UR does not cover the manufacture of equipment, fittings and appendages regardless whether they are made inside or outside of the shipyard, examples being as follows. Evidence of acceptance shall be provided by accompanying documentation from class surveyor at manufacturer and verified at the shipyard:
- a) hatch covers,
  - b) doors and ramps integral with the shell and bulkheads,
  - c) rudders and rudder stock,
  - d) all forgings and castings integral to the hull.
- 3.4 This UR applies to the installation into the ship, welding and testing of:
- 3.4.1 the items listed in 3.3 above
  - 3.4.2 equipment forming part of the watertight and weather tight integrity of the ship.
- 3.5 This UR applies to the hull structures constructed at any of the following:
- 3.5.1 shipbuilder's facilities,
  - 3.5.2 sub-contractors at the shipbuilder's facilities,
  - 3.5.3 sub-contractors at their own facilities or at other remote locations

**4. Qualification and monitoring of personnel**

- 4.1 Exclusive surveyors of the classification society, as defined in PR5, are to verify that the ships are built using approved plans in accordance with the relevant rules and statutory requirements. The surveyors are to be qualified to be able to carry out the tasks and procedures are to be in place to ensure that their activities are monitored. Details are specified in PR6 and PR7.

**5. Survey of the hull structure**

- 5.1 Table 1 provides a list of surveyable items for the hull structure covered by this UR, including:
- 5.1.1 description of the shipbuilding functions.
  - 5.1.2 classification and statutory survey requirements

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- 5.1.3 survey method required for classification
- 5.1.4 relevant IACS and statutory requirement references
- 5.1.5 documentation to be available for the classification surveyor during construction.
  - 5.1.5.1 the shipbuilder is to provide the classification surveyors access to documentation required by classification, this includes documentation retained by the shipbuilder or other third parties
  - 5.1.5.2 The list of documents approved or reviewed by the classification society for the specific new construction are as follows:
    - a) plans and supporting documents
    - b) examination and testing plans
    - c) NDE plans
    - d) welding consumable details
    - e) welding procedure specifications
    - f) welding plan or details
    - g) welder's qualification records
    - h) NDE operators qualification records
- 5.1.6 Documents to be inserted into the ship construction file. Refer to paragraph 11 for details.
- 5.1.7 A list of specific activities which are relevant to the shipbuilding functions. This list is not exhaustive and can be modified to reflect the construction facilities or specific ship type.
- 5.2 Evidence is also to be made available, as required, by the shipbuilder, to the surveyor whilst the construction process proceeds to prove that the material and equipment supplied to the ship has been built or manufactured under survey relevant to the classification rules and statutory requirements.

**6. Review of the construction facility\***

- 6.1 The society is to review the construction facilities prior to any steelwork or construction taking place in the following circumstances:

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\*Footnote: Reference is made to Appendix 1 "Shipyard review record", as an example.

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- 6.1.1 where the society has none or no recent experience of the construction facilities – typically after a one year lapse - or when significant new infrastructure has been added,
- 6.1.2 where there has been a significant management or personnel re-structuring having an impact on the ship construction process,
- 6.1.3 or where the shipbuilder contracts to construct a vessel of a different type or substantially different in design.

**7. Newbuilding survey planning**

- 7.1 Prior to commencing any newbuilding project, the society is to discuss with the shipbuilder at a kick off meeting the items listed in Table 1. The purpose of the meeting is to agree how the list of specific activities shown in Table 1 is to be addressed. The meeting is to take into account the shipbuilders construction facilities and ship type and deal with sub-contractors if it is known that the builder proposes to use them. The shipyard is to be informed of likely intervals for sampling and patrol activities. A record of the meeting is to be made, based upon the contents of the Table – the Table can be used as the record with comments made into the appropriate column. If the society has nominated a surveyor for a specific newbuilding project then the surveyor is to attend the kick off meeting. The builder is to be asked to agree to undertake ad hoc investigations during construction where areas of concern arise and for the builder to agree to keep the classification society advised of the progress of any investigation. Whenever an investigation is undertaken, the builder is to be requested, in principle, to agree to suspend relevant construction activities if warranted by the severity of the problem.
- 7.2 The records are to take note of specific published Administration requirements and interpretations of statutory requirements.
- 7.3 The record of the meeting is to be updated as the construction process progresses in the light of changing circumstances, e.g. if the shipbuilder chooses to use or change sub-contractors, or to incorporate any modifications necessitated by changes in production or inspection methods, rules and regulations, structural modifications, or in the event where increased inspection requirements are deemed necessary as a result of a substantial non-conformance or otherwise.

- 7.4 Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting. Structural fabrication is to be carried out in accordance with IACS Recommendation 47, "Shipbuilding and Repair Quality Standard for New Construction", or a recognized fabrication standard which has been accepted by the Classification Society prior to the commencement of fabrication/construction. The work is to be carried out in accordance with the Rules and under survey of the classification society.
- 7.5 The kick-off meeting may be attended by other parties as defined in PR3 (owner, administrations, etc.) subject to agreement by the shipbuilder.
- 7.6 In the event of series ship production and where the classification society has a continual presence in the shipyard, consideration may be given to modification of the kick off meeting. The agenda would include essential variables from previous ships, e.g. flag requirements, modifications from previous ships, effects of key dates etc. subject to mutual agreement with the builder. In any instance the classification society must maintain records to demonstrate compliance with Table 1. The classification society will still need to demonstrate that changes described in this section (paragraph 7) have been addressed.

## 8. Examination and test plan for newbuilding activities

- 8.1 The shipbuilder is to provide plans of the items which are intended to be examined and tested. These plans need not be submitted for approval and examination at the time of the kick off meeting. They are to include:
- 8.1.1 proposals for the examination of completed steelwork - generally referred to as the block plan and are to include details of joining blocks together at the pre-erection and erection stages or at other relevant stages
  - 8.1.2 proposals for fit up examinations where necessary
  - 8.1.3 proposals for testing of the structure (leak and hydrostatic) as well as for all watertight and weathertight closing appliances
  - 8.1.4 proposals for non-destructive examination
  - 8.1.5 any other proposals specific to the ship type or to the statutory requirements.

- 8.2 The plans and any modifications to them are to be submitted to the surveyors in sufficient time to allow approval before the relevant construction phase commences. The classification society is to require sample rates of NDE, proposals for steelwork survey, tank testing requirements, etc. if the actual construction process warrants it. The classification society is to demonstrate proof to justify the request.

## 9. **Proof of the consistency of surveys**

- 9.1 The classification society is to be able to provide evidence, e.g. through records, check lists, inspection and test records, etc. that its surveyors have complied with the requirements of the newbuilding survey planning and duly participated in the relevant activities shown in the shipbuilder's examination and test plans.
- 9.2 For audit purposes, the information specified in 9.1 is to be made available.

## 10. **Ship Construction File**

- 10.1 The shipbuilder is to deliver documents for the Ship Construction File. In the event that items have been provided by another party such as the shipowner and where separate arrangements have been made for document delivery which excludes the shipbuilder, that party has the responsibility.
- 10.2 It is recognised that the purpose of documents held in the Ship Construction File on board the ship, is to facilitate inspection (survey) and repair and maintenance, and, therefore, is to include in addition to documents listed in Table 1, but not be limited to:
- 10.2.1 as-built structural drawings including scantling details, material details, and, as applicable, wastage allowances, location of butts and seams, cross section details and locations of all partial and full penetration welds, areas identified for close attention and rudders (Z7.1, Z10.1, Z10.2, Z10.3, Z10.4, Z10.5 for COT, holds and ballast tanks of oil tankers, bulk carriers and chemical carriers),
- 10.2.2 manuals required for classification and statutory requirements, e.g. loading and stability, bow doors and inner doors and side shell doors and stern doors – operations and maintenance manuals (S8 and S9)
- 10.2.3 ship structure access manual, as applicable,

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- 10.2.4 copies of certificates of forgings and castings welded into the hull (W7 and W8),
- 10.2.5 details of equipment forming part of the watertight and weather tight integrity of the ship,
- 10.2.6 tank testing plan including details of the test requirements (S14),
- 10.2.7 corrosion protection specifications (Z8 and Z9),
- 10.2.8 details for the in-water survey, if applicable, information for divers, clearances measurements instructions etc., tank and compartment boundaries,
- 10.2.9 docking plan and details of all penetrations normally examined at drydocking.

**Enclosures: 1. Appendix 1  
2. Table 1.**

## Appendix 1

## Shipyard review record

Name of Shipyard	Date

### 1. Details of any management systems

Obtained Approval	Certified by	Expiry Date	Remarks (scope, etc.)
ISO-9001      ISO-9002			
ISO 14000			
ISO 18000			
Other:			

**2. Construction facilities:** (Documents such as a brochure of shipyard can be attached in lieu of completing this section.)

#### 2.1 Building Berth (B) or Dock (D)

\* In case of berth, Depth is not applicable.

B / D	Name	Length (m)	Width (m)	Depth* (m)	Building Capacity (G/T)	Crane (Ton x No.)

#### 2.2 Outfitting Quays

Name	Length (m)	Width (m)	Depth (m)	Berthing Capacity (G/T)	Crane (Ton x No.)

### 2.3 Main Fabrication and erection facilities

(1) Marking and cutting of steel plates (including internal members)	
- Marking method	( Manual, Photo x ____, EPM x ____, NC x ____ others _____ )
- NC cutting machine	( Gas x ____, Plasma x ____, Laser x ____ )
	Control procedure of NC ( On-line, other )
- Cutting equipment	( Edge planer x ____, Roll-shear x ____ )
(2) Marking and cutting of section bar	
- Marking method	( Manual, NC )
- Cutting method	( Manual, NC )
	- Marking of reference curved line ( Manual, NC )
	- In case of NC ( Gas x ____, Plasma x ____ )
(3) One-side automatic welding machine ( Yes, No )	
- Type of welding machine	( Flux Backing x ____, Flux and Copper Backing x ____ other _____ )
- Existence of special surface plate for plate welding	( Yes, No )
(4) Fillet welding machine ( Gravity, Automatic ) Percentage of automatization except gravity: about ____%	
- Line welder	( No, Yes: submerged arc x ____ heads, CO2 x ____ heads )
- Small automatic fillet welding machine	( No, Yes: Name: _____ x ____ )
- Welding robot	( No, Yes: Portal x ____, Rectangular x ____, Articulated x ____ )
(5) Painting equipment	
- Plate shot blasting/primer coating machine	( No, Yes: Max. Width _____ m, Length _____ m )
- Section bar shot blasting/primer coating machine	( No, Yes: Max. Length _____ m )
- Special coating factory	( No, Yes: _____ m x _____ m x ____ sections )
(6) Vertical automatic welding machine ( No, Yes: EG x ____, SEG x ____, ES x ____ )	
	EG: Electrogas SEG: Simplified Electrogas ES: Electroslag
(7) Other main fabrication facilities	

### 3. Shipyard control of Qualified Welders

(1) Normal steel

		certification	traceability	supervision	maintenance of qualification
Shipyard workers	confirm system in place				
Subcontracted workers	confirm system in place				

### 4. Feature of Construction Procedure

<p>(1) Subcontract of hull blocks (weight)</p> <ul style="list-style-type: none"> <li>- Sub members ( No, Yes: Ratio of subcontracted works ____ %, No., of subcontractors ____ )</li> <li>- Blocks ( No, Yes: Ratio of subcontracted works ____ %, No., of subcontractors ____ )</li> </ul>
<p>(2) Method of plate block assembly</p> <ul style="list-style-type: none"> <li>- Method fitting and welding longitudinals and transverse webs on jointed panels</li> <li>- Method welding longitudinals on jointed panels prior to fitting and welding transverse webs</li> <li>- Method fitting and welding a frame consists of longitudinals and transverse webs on jointed panels</li> <li>- Method jointing panels with pre-assembled longitudinals by welding prior to fitting and welding transverse webs</li> </ul>
<p>(3)- pre-erection outfitting carried out grand block/mega block adopted Method of erection at building berth/dock</p> <ul style="list-style-type: none"> <li>- Max. weight of loading block: _____ ton</li> <li>- Construction method in building dock/berth/land construction etc. ( 1 ship, 1.5 ships: Semi-tandem, dual entrance )</li> <li>- Block loading process ( single starting block, multi starting blocks, inserting block : No, Yes )</li> </ul>
<p>(4) Final dock ( No, Yes: In-house, Other place of the same company, Use other company )</p>
<p>(5) Other feature of construction procedure</p>

**5. Quality Control System: (Refer to Quality Manual, if available.)**

Item and description	Result	Remarks
(1) Existence of the organization chart including the departments of design, purchasing, manufacturing and quality assurance - Are the function, responsibility and competence of the organization clear?		
(2) Quality control organization - Existence of quality control organization - Number of employees in this organization  - Existence of procedures or plans related to tests and inspections	_____ persons including the chief	
(3) Pre-inspection system of shipyard - Is pre-inspection carried out prior to shipyard inspection? - Are pre-inspectors assigned? (Check the list.) - Number of pre-inspectors (related to hull only) - Are inspection results marked on the object and/or recorded in the checklist?	_____ persons	
(4) Records of inspections and tests - Are records made and kept properly? - Does the responsible person verify the records? - Can the adoption of necessary corrective actions against non-conformity happened be checked?		
(5) Condition at the time of the surveys in the presence of class surveyors - Is the schedule of the surveys changed often? - Are pre-inspection, shipyard inspection and repairs completed beforehand? - Are the sufficient preparations for surveys such as scaffoldings, lighting, cleaning made?		
Note: Above-mentioned (3) and (4) include the acceptance inspection of subcontracted items.		

## 6. Measures for Safety and Health

Item and description	Result	Remarks
(1) Are conditions of scaffolding, nets, safety belt, lighting and ventilation good?		
(2) Does sufficient attention paid for radiographic examination and operation of cherry picker?		
Note:		

## 7. Control System of Non-Destructive Examination(NDE)

Item and description	Result	Remarks
(1) Number of NDE supervisors in shipyard (including persons responsible for judging results)	_____ persons	
(2) Dependence on subcontracted NDE work - Number of shipyard employees - Number of sub-contractors	about _____( %) about _____( %)	
(3) NDE sub-contractor company's name and official technical qualifications	Name _____ (approved by) _____ Name _____ (approved by) _____	
(4) Grade and number of NDE employees with official technical qualifications in shipyard Specialized in radiography Specialized in ultrasonic Specialised in surface detection	___ Grade ___ persons ___ Grade ___ persons ___ Grade ___ persons	
(5) If non-destructive examinations are subcontracted, the grade and number of officially qualified persons Specialized in radiography Specialized in ultrasonic Specialised in surface detection	___ Grade ___ persons ___ Grade ___ persons ___ Grade ___ persons	
(6) Non-destructive examination equipment (in-house) - Number of radiographic equipment - Number of ultrasonic equipment	_____ _____	
Note: Even if all works are subcontracted, it is recommendable to attach the qualified person(s) who can verify the works.		

## 8. Quality Control on Production Line

Item and description	Result	Remarks
<b>8.1 Preventive measures for misuse of materials</b>		
(1) Job title of supervisor and person in charge of collating ordered steel and received steel, and checking of mill sheet	Title of supervisor: _____  Title of person in charge: _____	
(2) Are means for checking the material grade in hand prescribed for high-grade steels		
(3) Are regulations prescribed for checking the material grade for high-tensile steel and steel for low-temperature applications?  Are there regulations for inscribing high tensile steel on the surface of the high tensile steel and special indication for steel for low temperature applications?		
(4) Are procedures for re-using of remaining cut-off mild steel?		
(5) Are there procedures for re-using of remaining cut-off high-tensile steel?		
(6) In the case of (4) and (5) above, can a collation be made with the mill sheet?		
(7) Section of controlling the lists of remaining cut-off steel	Name of section: _____	
Note: - In case of high tensile steel, are means identifying different grades - In the case of (3) and (4) above, are the materials approved by other classes controlled similarly?		
<b>8.2 Shot blasting/Primer coating</b>		
(1) Existence of surface preparation standards		
(2) Existence of coating thickness control standards - Existence of thickness measurement records		
Note: - The standard is to include the description related traceability after shot blasting and primer coating.		

<b>8.3 Marking and cutting (Assembly work)</b>		
(1) Existence of standards for accuracy and periodical inspection of tape measures, tapes, stencils, etc.		
(2) Existence of standards for accuracy of cut dimensions and edge preparation		
(3) Existence of standards for finish of cutting face		
(4) What is the frequency and extent of maintenance and inspection carried out for ensuring accuracy of NC cutter and/or flame planer?		
(5) In case of NC, are the disks, tapes etc. maintained in good condition?		
(6) What are the measures adopted and guidance given to make the worker fully conversant with cutting work standards for maintaining accuracy?		
<p>Note:</p> <ul style="list-style-type: none"> <li>- In case of (2) and (3) above, check items are to include confirmation of edge preparations free from piercing hole.</li> <li>- NC for section bars is also to be in accordance with the above.</li> </ul>		
<b>8.4 Bending and strain free</b>		
(1) Existence of standards for maximum heating temperatures during water cooling and at the time of bending and distortion removal of steel by quick heating and cooling		
(2) Existence of regulations for plate thickness and bending radius for flange processing		
(3) What are the measures adopted and guidance given to make the worker fully conversant with maintaining quality and accuracy during the bending process?		
<p>Note:</p>		

<b>8.5 Control of Welding Procedure</b>		
(1) Are all welding procedures applied to the ships approved by the Society or other IACS members?		
Note:		
<b>8.6 Treatment of serious non-conformities</b>		
(1) Are repair plans submitted to the Society when serious non-conformities happened?		
(2) Were the NDE(RT/UT) plans submitted at appropriate timing?		
(3) Was the extent of tests extended considering the results of the test?		
Note:		
<b>8.7 Hydrostatic and Watertight Tests</b>		
(1) Is the test plan submitted to the Society?		
(2) Are vacuum tests applied to?		
(3) Are local air injection tests during sub-assembly works applied to?		
(4) If (2) or (3) above is applied to, are the test procedures approved by the Society?		
Note:		

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
	shipbuilding quality control function								
1	welding								
1.1	welding consumables	Classification approved separately at the manufacturer	review approval status and patrol, verify storage, handling and treatment in accordance with manufacturer's requirements	UR W17		consumable specification and approval status	not required	Identify consumables against approved list	
								verify temporary and permanent storage facilities	e.g. kept dry, covered, where applicable heated
								verify traceability	e.g. random batch number checking
1.2	welder qualification	Qualified welders	review of welder certification and patrol	Recommendation 47		shipyards records with individual's identification	not required	verify welder qualification standard, e.g. class or recognised standard approval	
								verify welder approved for weld position	
								verify validity of qualification certificate	

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Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
1.3	<b>Welding - mechanical properties (welding procedures)</b>	All weld joint configurations, positions and materials to be covered by weld procedures approved by the classification society or by another IACS member available	review and patrol	UR W28		Approved weld procedure specification and welding plan relevant to the ship project or process	not required	verify weld procedures records have been approved and cover all weld processes and positions in accordance with classification or recognised standards.	
		the classification society witnesses all new weld procedure qualification tests carried out in the shipyard whenever the classification society is surveying in the shipyard						verify procedures are available at relevant workstations	
								verify weld procedures are available for the surveyors reference	
1.3a	<b>welding equipment</b>	correctly calibrated and maintained	patrol and review			shipbuilders maintenance and calibration records	not required	verify condition of machinery and equipment.	
								verify machines are calibrated by appropriate staff	
								verify calibration carried out in accordance with manufacturer's recommendations	

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Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
								verify calibration in accordance with maintenance schedule	
1.3b	welding environment	satisfactory environment	patrol	Recommendation 47			not required	Verify welding areas clean, dry, well lit.	
								Confirm relevant measures taken for any pre or post heat treatment, drying of surfaces prior to welding	
								Confirm shielding gases, fluxes protected	
1.3c	welding supervision	sufficient number of skilled supervisors	patrol	Recommendation 20 and 47				verify supervision is effective	
1.4	welding- surface discontinuities	Substantially free from significant indications, satisfactory profile and size	visual examination, surface detection techniques, review of documents and patrol of operator	Recommendation 20 and 47		Shipbuilders and recognised standards and Rules as applicable, welding and NDE plans, NDE	not required	Identify workstations where NDE is carried out, e.g. panel line butt welds, castings into hull structure	
								Verify NDE carried out in accordance with approved plans where applicable	
								Verify suitability of NDE methods	
								Verify operators suitably qualified particularly where sub-contractors have been employed	
								Verify NDE is carried out according to the acceptable process	
								Review NDE records	

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Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
1.5	Welding - embedded discontinuities	NDE is to be carried out by qualified operators capable of ensuring that welds are substantially free from significant indications	Radiography and ultrasonic testing, review of documents and patrol of operator, examination of films	Recommendation 20 and 47		Shipbuilders and recognised standards and Rules as applicable, welding and NDE plans, NDE reports, operator qualifications	not required	Identify workstations where NDE is carried out, e.g. panel line butt welds, castings into hull structure	
								Verify NDE carried out in accordance with approved plans where applicable	
								Verify suitability of NDE methods	
								Verify operators suitably qualified particularly where sub-contractors have been employed	
								Verify that records have been completed and in accordance with recognised standards, e.g. IQI and sensitivity recorded	
								Verify that reports and radiographs have been evaluated correctly by the shipbuilder. Systematic review of radiographs carried out by the surveyor	
								Verify equipment calibration satisfactory and in accordance with manufacturers and recognised standards requirements	
								Verify NDE is carried out according to the acceptable process	
								2	Steel preparation and fit up:

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
2.1	surface preparation, marking and cutting	traceability and acceptability of material, check of steel plates & profiles materials type, scantling identification, testing marks	patrol	Recommendation 47		material certificates, shipbuilder's marking/cutting production documents at the workstage - documents retained at the facility	not required	Verify stockyard storage satisfactory	
								Verify material traceability, e.g. stamping identification against material certification, archiving of records	
								Verify transfer marking after treatment line	
								Verify standard of shotblasting and priming	
								Verify suitability of primer	
								Verify that steel grades can be identified	
								Verify machinery adjusted to maintain within IACS or manufacturers recommendations.	
								Verify accuracy of marking and cutting	
								Verify storage of piece parts.	
2.2	straightening	Approval of straightening methods/ procedures against deformation	patrol and review	Recommendation 47		recognised standards, approved procedures	not required	Verify that straightening processes are approved for the grade and type of steel, e.g. tmcp, z plate.	
								Verify that plates and sections are within recognised tolerances	

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
2.3	forming	Maintain material properties. Acceptance of forming method against unproper deformations	patrol	Recommendation 47		Shipbuilders procedure for hot forming	not required	Verify that temperature control is exercised by the operator.	
								Verify that suitable methods of temperature control are available when forming special steels and materials	
								Verify that forming processes are acceptable	
2.4	conformity with alignment/fit up/gap criteria	Check alignment/fit up/gap against reference standards	patrol	Recommendation 47		Shipbuilders and recognised standards and Rules as applicable,	not required	Verify the processes to ensure satisfactory fit up and alignment at all workstations	
								Verify that edge preparations are re-instated where lost during fitting operations	
								Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	
2.5	conformity for critical areas with alignment/fit up or weld configuration	Check alignment/fit up/gap against approved drawings	patrol and review	Recommendation 47		Shipbuilders and recognised standards and Rules as applicable, approved plan or standard, builder's records	Approved plans of critical areas if applicable	Verify that the information relevant to the latest approved drawings is available at the workstations	
								Verify the processes to ensure satisfactory fit up and alignment at all workstations	

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
								Verify that edge preparations are re-instated where lost during fitting operations	
								Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	
<b>3</b>	<b>Steelwork process, e.g. sub assembly, block, grand and mega block assembly, pre-erection and erection, closing plates</b>	compliance with approved drawings, visual examination of welding and material, check alignment and deformations	patrol of the process and witness of the completed item	Recommendation 47		approved plans, shipbuilders inspection records, Shipbuilders and recognised standards and Rules as applicable, construction plan (steelwork sub-division)		Verify that the information relevant to the latest approved drawings is available at the workstations	
								Verify that correct weld sizes have been adopted	
								Verify operation of the welding processes at the different work stages is satisfactory	
								Verify that the information relevant to the latest approved drawings is available at the workstations	
								Verify that piece parts are identifiable	
								Verify that fit ups are within recognised tolerances	
								Verify that correct welding requirements specified in reference 1 of this table have been adopted	

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
								Verify processes for closing plates etc. are acceptable	
								Confirm that steelwork is in accordance with the approved plan	
<b>4</b>	<b>Remedial work and alteration</b>	welding, check against deformation, alignment	review records and witness	Recommendation 47		permanent record of shipyard surveyable item		Verify that records have been maintained of significant deviations from the approved plans, for situations such as mis cut openings, re-routing outfit items	
								Verify that all deviations brought to the attention of the classification society by the shipbuilder are acceptable	
<b>5</b>	<b>Tightness testing, including leak and hose testing, hydropneumatic testing</b>	Absence of leaks	patrol of the process and witness of the test	UR S14	Reg. II-1/14 of SOLAS as amended;	approved tank testing plan, shipbuilders inspection records	approved tank testing plan	Confirm that tank testing is carried out in accordance with the approved plan	
								Confirm the methods used to carry out leak testing	
								Confirm that correct test pressures maintained for leak, hose and hydro and hydropneumatic testing is satisfactory	
								Verify that adequate records of the tank testing have been maintained	
<b>6</b>	<b>Structural testing</b>	structural adequacy of the design	witness testing	UR S14	Reg. II-1/14 of SOLAS as amended;	approved tank testing plan, shipbuilders inspection records.	approved tank testing plan	Confirm that tank testing is carried out in accordance with the approved plan	

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
								Confirm that correct test pressures maintained for testing is satisfactory	
								Verify that adequate records of the tank testing have been maintained	
<b>7</b>	<b>corrosion protection systems, e.g. coatings, cathodic protection, impressed current</b>	Salt water ballast tanks with boundaries formed by the hull envelope, and also bulk	Review and report on builder's & manufacturer's documentation	UR Z 8 and Z 9, UI SC122, UR F1	Reg. II-1/3-2 of SOLAS as amended;	manufacturer's and builder's specification	corrosion protection specifications	Verify that applied coatings are approved and review records of application	
								Verify that adequate records have been maintained and copied to the ship file	
<b>8</b>	<b>Installation, welding and testing of the following:</b>								
<b>8.1</b>	<b>hatch covers</b>	tightness and securing	witness	UR S14 & Rec 14	Reg. 13-14-15 and 16 of ILLC '66	approved tank testing plan, shipbuilders inspection records,	details required, structural drawings	Confirm leak test of hatch covers	
								Confirm operation and securing test	
<b>8.2</b>	<b>doors and ramps integral with the shell and bulkheads</b>	tightness and securing	witness	UR S14	Reg. II-1/18 of SOLAS as amended; Reg. 12 and 21 of ILLC '66	approved tank testing plan, shipbuilders inspection records,	details required	Confirm leak test	
								Confirm operation and securing test	
								Confirm safety device operation	

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Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
								Ensure correct maintenance logs/manuals supplied with the ship construction file	
8.3	rudders	fitting	witness	UR S14		approved plan, shipbuilders inspection records,	details required, structural drawings	Confirm alignment and mounting and fitting up to the connection to the tiller	
								Confirm function test	
								Verify fitting of pintles and all securing bolts	
								Verify all fit up records including all clearances maintained and placed into ship construction file	
8.4	forgings and castings	compliance with approved drawings, visual examination of welding and material, check alignment and deformations	patrol of the process and witness of the completed item	UR W7 & W8		approved plans, shipbuilders inspection records, Shipbuilders and recognised standards and Rules as applicable, construction plan (steelwork sub-division)	copies of certificates of forgings and castings	Verify casting and forgings against material certificate	
								Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted	
								Verify that material certificates are included in the ship construction file	
	appendages							Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted	

**Table 1, IACS Unified Requirement Z 23**

Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project	
8.5	equipment forming the watertight and weathertight integrity of the ship, e.g. overboard discharges, air pipes, ventilators	tightness and securing	witness		Reg. II-1/19 of SOLAS as amended; Reg. 17-18-19-20-22-23 of ILLC '66	approved tank testing plan, shipbuilders inspection records,	details required,	Verify that correct welding and fit up requirements specified in reference 1, 2.4 and 2.5 of this table have been adopted		
								Verify Compliance with Load line Convention 1966 as amended - i.e.all fittings in accordance with the record of freeboard assignment		
				UR P3					Verify air pipes, vents etc closing device are approved type	
									Verify material certificates for overboard discharges where applicable	
									Verify record of freeboard assignment and all material certificates included in the ship construction file	
	Freeboard marks and draft marks	within allowable tolerances and in accordance with the freeboard assignment	witness	UI-LL4	Reg. 4- 5- 6- 7 and 8 of ILLC '66		details required	Verify freeboard marks in accordance with load line assignment		
								Verify draft marks in accordance with the agreed tolerances specified by the builder unless more onerous flag state requirements		
	Principal dimensions	within allowable tolerances	review and witness	Recommendation 47			details required	Verify principal dimensions in accordance with recognised standard		

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Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	statutory requirements and relevant reference	Documentation available to classification surveyor during construction	Documentation for ship construction file	Specific activities	Classification society proposals for the project
								Verify dimensions included in ship construction file	
	<b>Safety Construction certification</b>	no outstanding imperfections or defects	witness		Reg. 10 of SOLAS as amended			Verify that Administration requirements have been incorporated into the hull structure	

<b>Shipbuilder's name</b>	
<b>project</b>	
<b>project duration</b>	
<b>kick off meeting date</b>	
<b>representing builder</b>	
<b>representing class society</b>	

\* IACS Recommendations are not mandatory requirements.