

Supplementary Specification to EN 13852-1 General-purpose offshore cranes

Revision history

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Foreword

This specification was prepared under a Joint Industry Project 33 (JIP33) “Standardization of Equipment Specifications for Procurement” organized by the International Oil & Gas Producers Association (IOGP) with the support from the World Economic Forum (WEF). Ten key oil and gas companies from the IOGP membership participated in developing this specification under JIP33 Phase 2 with the objective to leverage and improve industry level standardization for projects globally in the oil and gas sector. The work has developed a minimized set of supplementary requirements for procurement, with life cycle cost in mind, based on the ten participating members’ company specifications, resulting in a common and jointly approved specification, and building on recognized industry and international standards.

This specification has been developed in consultation with a broad user and supplier base to promote the opportunity to realize benefits from standardization and achieve significant cost reductions for upstream project costs. The JIP33 work groups performed their activities in accordance with IOGP’s Competition Law Guidelines (November 2014).

Recent trends in oil and gas projects have demonstrated substantial budget and schedule overruns. The Oil and Gas Community within the World Economic Forum (WEF) has implemented a Capital Project Complexity (CPC) initiative which seeks to drive a structural reduction in upstream project costs with a focus on industry-wide, non-competitive collaboration and standardization. The vision from the CPC industry is to standardize specifications for global procurement for equipment and packages, facilitating improved standardization of major projects across the globe. While individual oil and gas companies have been improving standardization within their own businesses, this has limited value potential and the industry lags behind other industries and has eroded value by creating bespoke components in projects.

This specification aims to significantly reduce this waste, decrease project costs and improve schedule through pre-competitive collaboration on standardization. This document defines the supplementary requirements to recognized industry standard EN 13852, 2nd Edition, 2013, Cranes - Offshore cranes – Part 1: General-purpose offshore cranes, which is indispensable for the application of this specification.

Following agreement of the relevant JIP33 work group and approval by the JIP33 Steering Committee, the IOGP Management Committee has agreed to the publication of this specification by IOGP. Where adopted by the individual operating companies, this specification and associated documentation aims to supersede existing company documentation for the purpose of industry-harmonized standardization.

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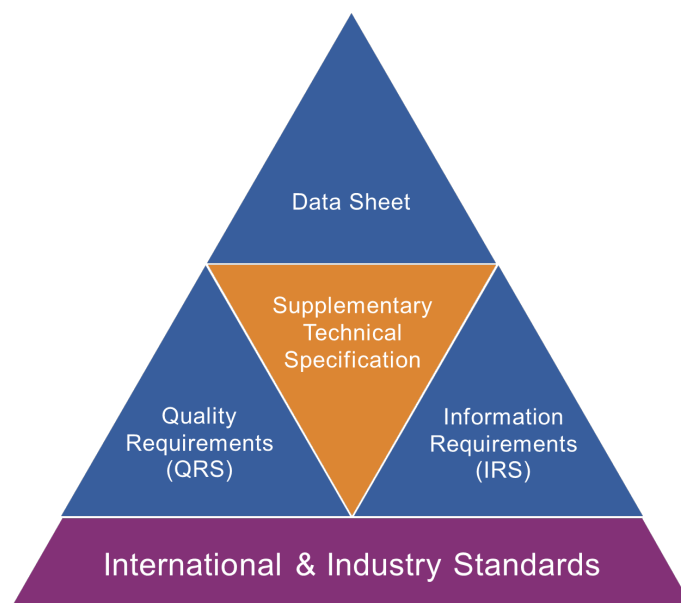
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Introduction

The purpose of this specification is to define a minimum common set of supplementary requirements for procurement of general-purpose offshore cranes to EN 13852-1 2nd Edition 2013, for application in the petroleum and natural gas industries.

This JIP33 standardized procurement specification follows a common document structure comprising the four documents as shown below, which together with the purchase order define the overall technical specification for procurement.



JIP33 Specification for Procurement Documents Supplementary Technical Requirement

It is required to use all of these documents in conjunction with each other when applying this specification, as follows:

IOGP S-617: Supplementary specification to EN 13852-1 General-purpose offshore cranes

This specification is written as an overlay to EN 13852-1, following the clause structure of the parent standard, to assist in cross-referencing the requirements. Where clauses from the parent standard (EN 13852-1) are not covered in this specification, there are no supplementary requirements or modifications to the respective clause. The terminology used within this specification follows that of the parent standard and otherwise is in accordance with ISO/IEC Directives, Part 2.

Modifications to the parent standard defined in this specification are identified as Add (add to clause or add new clause), Replace (part of or entire clause) or Delete.

IOGP S-617D: Datasheet for General-purpose offshore cranes

This document provides project specific requirements where the supplementary specification and its parent standard require the user to define an application specific requirement. It follows the clause structure of the parent standard and this specification. It also includes information required by the user for technical evaluation. Additional purchaser supplied documents are also listed in the datasheet, to define scope and technical requirements for enquiry and purchase of the equipment.

IOGP S-617L: Information requirements specification (IRS) for General-purpose offshore cranes

This document defines the information requirements, including format, timing and purpose, for information to be provided by the manufacturer. It also defines the specific conditions which must be met for conditional information requirements to become mandatory. The information requirements listed in the IRS have references to the source of the requirement.

IOGP S-617Q: Quality requirements specification (QRS) for General-purpose offshore cranes

This document includes a conformity assessment system (CAS) which specifies standardized user interventions against quality management activities at four different levels. The applicable CAS level is specified by the user in the datasheet.

The datasheet and IRS are published as editable documents for the user to specify application specific requirements. The supplementary specification and QRS are fixed documents.

Unless defined otherwise in the requisition, the order of precedence (highest authority listed first) of the documents shall be:

- a) regulatory requirements;
- b) contract documentation (e.g. purchase order);
- c) user defined requirements (equipment datasheet, IRS, QRS);
- d) this specification;
- e) the parent standard.

2 Normative references

Add to clause

AWS D1.1/D1.1M:2010	Structural Welding code – steel [Alternative to ISO 3834 and ISO 17635]
EN 10164	Steel products with improved deformation properties perpendicular to the surface of the product – Technical delivery conditions
EN 13852-1:2013	General-purpose offshore cranes
EN 1993-1-10	Eurocode 3: Design of steel structures – Material toughness and through-thickness properties
ISO 3834	Quality requirements for fusion welding of metallic materials Pts 1 to 6 [Alternative to AWS D1.1/D1.1M:2010]
ISO 17635	Non-destructive testing of welds – General rules for metallic materials [Alternative to AWS D1.1]

4 List of significant hazards

Add to clause

The risk assessment and failure mode analysis outputs (refer to EN 13852-1, Clause 4 and Annex D respectively) shall include a definition of the crane primary (critical) components (refer to EN 13852-1, 3.3.1) and the verification activities required to demonstrate their conformance.

5 Safety requirements and/or protective measures

5.2 Strength and stability

Add new subclause heading

5.2.9 Detailed design and fabrication

Add new subclause

5.2.9.1 General

The design of structural interfaces, including the pedestal adaptor, shall ensure:

- adequate alignment between different structures, accounting for fabrication tolerances; and
- compatibility of material stiffness, distortion and displacement during fabrication, installation and in-service conditions.

Add new subclause

5.2.9.2 Welding

Welding shall be in accordance with ISO 3834 or AWS D1.1/D1.1M.

The welding of primary (critical) components shall be in accordance with ISO 3834-2 and with acceptance criteria in accordance with ISO 17635 Level B or AWS D1.1 Section 6.

5.3 Equipment and components

5.3.2 Non electrotechnical equipment

Add to subclause

Equipment and components including valves, filters, fittings, bearings and seals in equivalent service shall be interchangeable as far as practicable, for the purpose of minimizing spare parts.

5.3.3 Power requirements

Add to subclause

For high-power applications, as selected in the datasheet, the installed power shall not be less than the highest of the required power for:

- full hoisting speed and full luffing speed and the power to drive all ancillary controls and systems; or
- full hoisting speed and 50 % luffing speed and 50 % slewing speed and power to drive all ancillary controls and systems.

These power requirements apply to the maximum rated capacity on either hoist winch, in any crane or hook configuration, for any sea states, at any radii.

For diesel engines, the fuel tank shall be sized to operate the engine at 75 % capacity for a minimum of 12 hours.

5.3.4 Slewing drives

Delete NOTE from subclause

Add to subclause

Slew drives shall have a means of adjusting backlash on site.

5.3.5 Slewing bearings

Add to subclause

The soft spot location on the slew bearing ring shall be clearly and permanently marked.

Brackets for a jacking system shall be provided on the crane and pedestal adaptor, to allow for the replacement of the slew bearing.

The jacking system shall be designed to withstand environmental loadings, as defined in the datasheet, for out-of-service conditions, with the boom in its rest.

5.3.10 Wire ropes

Add new subclause

5.3.10.1 Rope sheaves and wire drums

All wire rope sheaves and wire rope drums shall have a minimum D/d ratio of 20:1.

Add new subclause

5.3.10.2 Hoist wire rope wear protectors on booms

Hoist wire rope wear protectors on booms shall be designed to withstand all expected impacts and running of wire ropes across them during normal operation and rope replacements.

Wear protectors shall:

- prevent snagging of the ropes; and
- not become a potential dropped object hazard.

Add new subclause

5.3.10.3 Wire rope replacements

Permanently installed platforms shall facilitate wire rope replacement.

5.3.11 Blocks and hooks

Add to subclause

A means to park the main hook block while the auxiliary block is in use shall be provided.

Add new subclause

5.3.15 Pedestal adaptor

The pedestal adaptor shall include lifting points, for lifting during installation. It shall also include any other required installation aids for handling, and connection of the pedestal adaptor onto the pedestal.

5.4 Drive systems

5.4.3 Hydraulic systems

Add to subclause

The hydraulic oil grade and cleanliness shall be specified by the crane manufacturer, for all operating conditions, including factory acceptance test (FAT), site acceptance test (SAT) and operating location.

All hydraulic components shall be suitable for an offshore environment, including resistance to corrosion. Flanges, split flanges and hose ends which are not AISI 316L material shall be chromated and protected with grease band (petroleum impregnated tape or equivalent).

The hydraulic oil tank shall have means for complete drainage and cleaning. It shall be equipped with a breathing filter, located and designed to prevent potential vapour hazard to personnel.

Hose ends shall allow the fitting of plugs or caps for maintenance.

Hydraulic hoses shall be pressure tested to 1,5 times the maximum working pressure.

All hydraulic lines shall have permanent identification, traceable to the hydraulic schematic, hose register and certificates.

Suction lines from the tank to the pumps shall have isolation valves, to accommodate pump and hose replacement without the need for draining the oil tank. Isolation valves shall be secured in open positions, and be permanently and clearly labelled.

The oil tank shall contain a local visual oil level indicator and separate low and low-low oil level detectors. The low-low level detection point must be set clearly below the low-level detection point.

Upon detection of a low oil level, there shall be audible and visual alarms within the operator cabin.

Upon detection of a low-low oil level, there shall be audible and visual alarms within the operator cabin, separate to the low oil level alarms. The crane shall be automatically shut down if the low level and separate low-low level alarms have both activated.

The hydraulic system shall include allowance for an additional circulation system for continuous flushing, filtration and removal of water from the hydraulic oil. This system shall comprise of a separate circulation pump and necessary filters. The circulation system shall be provided if selected in the datasheet.

Accumulators shall be equipped with a pressure gauge and permanent means for draining to verify the pre-charge pressure. Necessary fittings for refilling shall be installed.

Test points shall be provided on the main pressure lines, return lines and on any pilot and boost lines in the hydraulic system. All test points shall be clearly labelled.

The hydraulic system and surroundings shall be designed for spillage containment.

Before handover at site acceptance test, the cleanliness of the hydraulic system shall be tested and certification provided.

5.5.2 Control cabin

Add to item b)

Window shall have powered wipers capable of clearing a minimum of 80 % of the screen area.

Add to subclause

g) A means to shade the operator from sunlight, from any direction, shall be provided.

5.5.7 Communications

Replace second sentence with

The crane operator shall be able to operate the radio communication system by a microphone speaker system or microphone headset system, without moving their hands from the main control levers.

Add to subclause

The crane communication system shall include a public-address system.

5.6 Noise reduction

5.6.1 Noise reduction at source by design

Replace second paragraph with

The weighted sound pressure emissions level, measured according to Annex N, shall be taken in the operator cabin with the prime mover running:

- at idle and the with crane controls in the neutral position;
- at full throttle with and without maximum rated loads.

The maximum allowable noise levels shall not exceed:

- 75 dB(A) at the normal operator position with the cabin door closed;
- 85 dB(A) measured 1 m from the outside of the machine house and from any engine exhaust.

5.7 Access, guards etc

5.7.1 Access

Add to subclause

Access shall be provided to all crane components which require routine inspection and maintenance, without the need for special scaffolding, rope access or similar special equipment. This shall be provided on the crane itself, unless suitable access to all required components is provided by other permanent means from the facility on which the crane is installed.

This includes the provision of all ladders, walkways and platforms necessary to access components, such as:

- A-frame head sheaves and critical pins, lights, anemometers, boom buffers, etc.;
- boom connectors, sheaves, pins, lights, rated capacity limiter system (RCL) components, heel pins;
- winches; and
- exterior cabin components such as windscreen wipers, horns, heating ventilation and air conditioning (HVAC) units, loud-speakers, etc.

All ladders, walkways and platforms shall include appropriate handrails suitable for normal personnel access.

The boom design shall incorporate permanent access to the connector fasteners on the top, bottom and both sides of the boom.

Permanent access to the boom hoist dead end connection shall be provided.

All grease nipples shall be easily accessible, with the crane boom stowed in the boom rest, from permanently installed walkways and platforms.

5.7.5 Lifting arrangements for maintenance

Add to subclause

Ram-luffing, telescoping and knuckle-boom cranes shall be provided with:

- padeyes for luffing cylinder removal; and
- means to service and replace the ram or telescopic boom cylinder.

Maintenance davits, lifting beams and padeyes shall be provided to enable all major components to be replaced without the need for the use of additional cranes. This includes all components in the machinery house (such as the prime mover, gearbox, cabinets and pumps), winches, sheaves and slew drive components.

All major structural components (including the pedestal adaptor, machinery deck, cabin, machinery house, A-frame and boom sections) shall be provided with suitable lifting points, or other approved means, to enable components to be lifted individually. Procedures and instructions for their use (installation, operation and maintenance manual) shall be provided.

The maintenance instructions shall include detailed lifting procedures for the lifting of each major structural component (including the pedestal adaptor, machinery deck, cabin, machinery house, luffing cylinders, knuckle cylinders, telescoping cylinders, A-frame and boom sections). The procedures shall include drawings with clearly marked (and verified) centre of gravity and total weight.

All lifting points, davits, lifting beams and padeyes shall be permanently and legibly marked with a unique identification number and the safe working load, and identified within the installation, operation and maintenance manual lifting procedures.

5.8 Controls, indicators and limiting devices

5.8.2 Controls

Add to subclause

It shall not be possible:

- to operate the main and auxiliary hoists simultaneously; nor
- for the operator to change between main and auxiliary hoists during a lifting operation.

5.8.3 Indicators

5.8.3.10 Data recorder

Replace subclause with

A data recorder with the following features shall be installed:

- records crane motions, loads and lifetime load cycle history;
- enables the key operational parameters of the crane to be reviewed.

As a minimum, the system shall record the following information when the crane is operating:

- date (dd/mm/yyyy);
- time (hh/mm/ss);
- duration (s);
- rated load at hook position for all hoists;
- actual load at hook position for all hoists;
- boom radius and angle;
- peak dynamic load at hook position for all hoists;
- load chart;
- alarm activation;
- any overrides or bypass activated or alarms acknowledged; and
- crane operator unique identification (if selected in datasheet).

The system shall be automatic and not require any manual activation. It shall not be possible to deactivate the data recorder.

The memory shall be of sufficient capacity to record and store all data, without requiring download or external backup, for a minimum of 180 calendar days.

The memory shall be able to be downloaded via standard means.

The output data file should be in a comma-separated values format or equivalent common user format.

If any proprietary software or hardware is required, it shall be supplied with the crane. Any passwords that are required to access the system shall be provided in the instruction manual.

5.8.4 Limiting devices

5.8.4.2 Motion limiters

Add to subclause

All motions (hoist, luff and slew) which have limits shall have both a speed reduction limit and a working limit.

The speed reduction limit shall activate before the working limit, to reduce the speed before activation and avoid sudden motion stop and shock loading.

On rope luffing cranes, the luffing system shall be fitted with an independent boom upper ultimate limit which stops all luff up motion in the event of the luff upper limit failing.

5.9 Protection systems

5.9.2 Emergency operation system

Add to subclause

Emergency lowering functions shall be independent of the main crane systems. Manual lowering of loads and release of slew brakes shall remain possible in the event of loss, or unavailability, of the crane's main control system.

Add new subclause

5.11 Spill protection

Where hazardous materials such as oil, fuel or coolant are used, the crane shall be designed to ensure that any hazardous materials and substances are contained and able to be easily drained without environmental impact.

6 Verification of the safety requirements and/or protective measures

Add new subclause

6.3 Verification records

The manufacturer shall retain documented information (records) of the results of verification activities and, when specified, issue records to the purchaser in accordance with IOGP S-617L.

NOTE 1 Verification records may be issued individually or compiled as part of the information for use or technical construction file or the manufacturer's record book.

NOTE 2 See IOGP S-617Q for requirements for the certification and traceability of components to verification records.

7 Information for use

7.1 Documentation

Add to subclause

The installation, operation and maintenance manual shall include access codes required to:

- perform fault diagnostics;
- replace and adjust components of the control system; and
- restart the system after replacing and adjusting any components.

7.4 Marking

7.4.3 Components

Add to subclause

All components shall be traceable to the original equipment manufacturer (OEM) information. If the crane manufacturer adds identification details, this shall not interfere with or detract from any OEM information.

All OEM parts information shall be readily identifiable in crane documentation, including drawings and spare parts records, and not replaced by crane manufacturer information.

Add new clause

7.5 Component identification system

The component identification system (sometimes referred to as tag numbering) is used to identify components or sub-assemblies on the crane. This is used for multiple purposes including the management of spare parts and maintenance.

The crane assembly shall be assigned a single end-user tag number, identified in the datasheet.

Manufacturers are required to identify all components in the installation, operation and maintenance manual, for spare parts procurement and troubleshooting purposes.

Following is a description of the requirements for each of the options, selected in the datasheet.

Option 1: Manufacturer system

The standard component identification system used by the manufacturer, without any purchaser modifications.

Option 2: Integrated manufacturer - purchaser system

The standard component identification system used by the manufacturer, with only the listed component and sub-assemblies identified using the purchaser system.

Components, which are part of another end-user facility system, shall be identified using the purchaser component identification system, including the systems and components detailed in Table 6.

The sub-assemblies detailed in Table 7 shall also be assigned a single end-user identification. The individual components within the sub-assembly shall be identified by the manufacturer's component identification system, unless these form part of another end-user facility system, described above.

Add new table

Table 6 – Purchaser system identification items

System	Typical components
Fire & Gas	Fire & gas detectors, cables, junction boxes
Facility-connected lighting	Lights, cables, junction boxes
Aircraft warning lights	Lights, cables, junction boxes
Telecommunications	Radios, telephone, cables, junction boxes
Power supply	Slipring, starter cabinet, distribution panel, junction boxes

Add new table

Table 7 – Manufacturer sub-assembly identification items

Sub-assembly	Detail
Winches	One identification for each winch unit (e.g. main hoist, auxiliary hoist, luff)
Slewing drives	One identification for slew drive system
Ram-luffing system	One identification for ram-luffing cylinder system
Knuckle system	One identification for knuckle cylinder system
Telescoping system	One identification for telescoping system
Crane cabin	One identification for crane cabin
Prime mover	One identification for prime mover assembly, incl. gearbox and pumps
Emergency operating system	One identification for emergency operating system
Pedestal adaptor	One identification for pedestal adaptor

Option 3: Purchaser system

A component identification system described by the purchaser.

Annex C (normative) **Environmental influences**

C.7 Corrosion protection

Replace first paragraph with

All exposed surfaces and components shall be protected by a surface protection system based on material type and minimum and maximum operating temperatures and the specified crane operational life.

Annex E (normative) **Material selection**

E.5 Welded structures

Replace fifth paragraph with

Welded steel plates with significant tensile stresses perpendicular to the plane of the plate shall conform to EN 10164 quality class Z35. Evaluation of the requirement for guaranteed through thickness properties shall be performed in accordance with EN 1993-1-10.

Bibliography

Add to clause

- [20] ISO 19901-3, Petroleum and natural gas industries - Specific requirements for offshore structures – Part 3: Topsides structure
- [21] API Recommended Practice 2A–WSD (RP 2A-WSD), Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms—Working Stress Design Planning 22nd Edition, November 2014
- [22] ILO Convention C152, Occupational Safety and Health (Dock Work) Convention

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