MATERIAL AND EQUIPMENT STANDARD

FOR

OFFSHORE CRANES

ORIGINAL EDITION

JULY 1995

This standard specification is reviewed and updated by the relevant technical committee on Sep. 2012. The approved modifications are included in the present issue of IPS.

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FOREWORD

The Iranian Petroleum Standards (IPS) reflect the views of the Iranian Ministry of Petroleum and are intended for use in the oil and gas production facilities, oil refineries, chemical and petrochemical plants, gas handling and processing installations and other such facilities.

IPS are based on internationally acceptable standards and include selections from the items stipulated in the referenced standards. They are also supplemented by additional requirements and/or modifications based on the experience acquired by the Iranian Petroleum Industry and the local market availability. The options which are not specified in the text of the standards are itemized in data sheet/s, so that, the user can select his appropriate preferences therein.

The IPS standards are therefore expected to be sufficiently flexible so that the users can adapt these standards to their requirements. However, they may not cover every requirement of each project. For such cases, an addendum to IPS Standard shall be prepared by the user which elaborates the particular requirements of the user. This addendum together with the relevant IPS shall form the job specification for the specific project or work.

The IPS is reviewed and up-dated approximately every five years. Each standards are subject to amendment or withdrawal, if required, thus the latest edition of IPS shall be applicable

The users of IPS are therefore requested to send their views and comments, including any addendum prepared for particular cases to the following address. These comments and recommendations will be reviewed by the relevant technical committee and in case of approval will be incorporated in the next revision of the standard.

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GENERAL DEFINITIONS

Throughout this Standard the following definitions shall apply.

COMPANY :

Refers to one of the related and/or affiliated companies of the Iranian Ministry of Petroleum such as National Iranian Oil Company, National Iranian Gas Company, National Petrochemical Company and National Iranian Oil Refinery And Distribution Company.

PURCHASER :

Means the “Company" where this standard is a part of direct purchaser order by the “Company”, and the “Contractor” where this Standard is a part of contract document.

VENDOR AND SUPPLIER:

Refers to firm or person who will supply and/or fabricate the equipment or material.

CONTRACTOR:

Refers to the persons, firm or company whose tender has been accepted by the company.

EXECUTOR :

Executor is the party which carries out all or part of construction and/or commissioning for the project.

INSPECTOR :

The Inspector referred to in this Standard is a person/persons or a body appointed in writing by the company for the inspection of fabrication and installation work.

SHALL:

Is used where a provision is mandatory.

SHOULD:

Is used where a provision is advisory only.

WILL:

Is normally used in connection with the action by the “Company” rather than by a contractor, supplier or vendor.

MAY:

Is used where a provision is completely discretionary.

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APPENDICES:

0. INTRODUCTION

This Specification gives the amendment and supplement to API Spec 2C Sixth Edition, September 2004 “Specification for Offshore Pedestal Mounted Cranes”.

For ease of reference, the clause (or paragraph) numbering of API Specification 2C has been used throughout of this specification. Clauses in API Spec 2C not mentioned remain unaltered.

For the purpose of this specification the following definitions shall hold:

Sub. (Substitution):	The API Spec. clause is deleted and replaced by the new clause.
Del. (Deletion):	The API Spec. clause is deleted without any replacement.
Add. (Addition):	A new clause with a new number is added.
Mod. (Modification):	Part of the API Spec. clause is modified and/or a new statement or comment is added to that clause.

SECTION 1

1. SCOPE

Note:

This standard specification is reviewed and updated by the relevant technical committee on Sep. 2012. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No 357 on Sep. 2012. These modifications are included in the present issue of IPS.

1.1 General

This Specification contains the minimum requirements for offshore cranes to be used in, production, drilling and exploration facilities and new ventures, wherever applicable.

No deviation from this specification is permitted without explicit approval of the Company.

The intended deviations shall be clearly indicated and separately listed in the vendor's proposal.

Compliance with the requirements of this specification does not relieve the Vendor of the responsibility for furnishing a unit of proper design, strength, workmanship and materials to suit the specified operating conditions. **(Mod.)**

1.7 Conflicting Requirements

In case of conflict between this specification and inquiry or order following priority of documents shall apply:

First Priority:	Purchase order and variations thereto	
Second Priority:	Data-requisition sheets	
Third Priority:	This specification	**(Add.)**

1.8 Site Location and Conditions

Site location and conditions shall be specified by the Purchaser complying the requirements of Appendix C. **(Add.)**

1.9 Scope of Supply

Vendors scope of supply as a minimum shall include following items:

a) The primer mover and its related accessories.

b) Complete booms, hoist unit, hoist gearbox, hoistbrake and limit switches.

c) Complete pedestal system with controls and stoppers.

d) Emergency stop system.

e) Air craft hazard warning lights.

f) Flood and spot lights for night time lifting illumination.

g) All access platforms and ladders from the pedstal adaptor and upwards.

h) Radio communication equipment.

i) All hoses for connection to the platform utilities at the pedestal adaptor, and terminated

with quick connect couplings.

j) All internal and external surface preparation, coating and preservations suitable for offshore condition.

k) Inspection and witnessed testing certificates.

l) All design drawings and documentations necessary for the installation of the crane.

m) Pedestal adaptor piece or king post prepared ready for welding to the platform pedestal.

n) Slew ring bearing and full set of bolting. **(Add.)**

2. REFERENCES

Throughout this Standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies. **(Mod.)**

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-GN-100	"Engineering Standard for Units"
IPS-M-PM-290	"Material and Equipment Standard for Reciprocating Internal Combustion Engines"

IEC (INTERNATIONAL ELECTROTECHNICAL COMMITTEE) **(Add.)**

3.3 UNITS

This Standard is based on International System of Units (SI), as per IPS-E-GN-100 except where otherwise specified. **(Mod.)**

4. CRANE RATINGS

4.7 Main power hoist and its related accessories, boom hoist and swing shall be designed for simultaneous full-load operation on the three motions, (luffing, booming and slewing). **(Add.)**

6. DESIGN AUTHENTICATION AND TESTING

6.4 Tests Responsibility

The tests shall be the responsibility of the manufacturer and shall be carried out at the manufacturer's works or at a place to be agreed between the purchaser and the manufacturer. Additional tests may be carried out subject to agreement between the manufacturer and purchaser. The manufacturer shall clearly indicate whether or not the hook block is to be considered as part of the test load. The weight of slings, equalizing beams and other similar devices for handling test loads shall be taken as part of the test load. **(Add.)**

6.5 Functional Test

The operational functions of the complete crane shall be tested with no load to demonstrate the

satisfactory operation of each control device and, where fitted, each cut-out device for overhoisting, overlowering, overslewing and overderricking. **(Add.)**

6.6 Stability Test Criteria

Stability tests using test loads shall be considered to be successful if the load remains static at 200 mm above the ground for at least 10 min. **(Add.)**

6.7 Mechanical Test

Vendor shall demonstrate to inspector that the complete crane is constructed to the specification and data requirements and is ready for operation. Tests shall be carried out to prove the following:

a) Overload test

The crane shall be tested to lift and sustain a minimum test load of 125 percent of the safe working load at fully extended boom position and shall be witnessed by third party inspection and/or purchaser's representative.

b) Motion test

During the overload test, each motion in turn shall be maneuvered in both directions and the crane shall sustain the load under full control. The crane shall prove itself capable of dealing with the overload and specified speed without difficulty. **(Add.)**

6.8 Telescoping

For cranes fitted with telescopic jibs, the telescoping motion shall be tested through the range of applicable duties. **(Add.)**

7.2.1 Construction

Where two or more ropes are used in a system, means shall be provided for ensuring that tensile forces in the ropes are distributed in the designed proportions. Arrangements entailing reverse bends shall be avoided as far as possible. A rope reeving diagram shall be provided. **(Mod.)**

7.5.4.4 Load Hook, Ball Assemblies and Load Blocks

Swiveling hooks shall be mounted on anti-friction bearings suitable for the purpose. If required, a locking device shall be fitted to prevent rotation of the hook. **(Add.)**

7.2.5 Fly Jib Pendant Ropes

Where ropes are used to support a fixed offset fly jib, the distances between the support point centers shall be specified by the manufacturer to enable the fly jib offset to be correctly set under working conditions. **(Add.)**

8. BOOM HOIST, LOAD HOIST AND TELESCOPING BOOM MECHANISMS

8.1 Hoists

8.1.1 Brakes

8.1.5 Lubrication and cooling

8.1.5.4 All bearings shall be adequately lubricated. Plain bearings or their shafts shall have oil or grease grooves. All lubrication nipples should be of similar size and type and shall be readily accessible. Where access for lubrication is difficult, bearings shall be such that lubrication is required as infrequently as possible or facilities for lubrication from a remote position shall be provided. A lubrication diagram shall be provided.

8.2.3 Auxiliary holding device

8.2.3.2 The hydraulic system shall be provided with pressure gage(s) and overpressure relief valve(s). **(Mod.)**

8.3 Telescoping Boom Mechanisms

c) Ropes, when used for, or in conjunction with telescoping, shall have a nominal breaking strength not less than three and one half times the load applied to the rope. Means shall be provided to minimize the possibility of the crane jamming during raising and lowering or to protect the rope from being excessively loaded.

d) For cranes with lifting capacity less than 5 ton and, whenever installation of lattice boom is not practicable, telescopic boom shall be used to improve the crane maneuver. **(Mod.)**

9. SWING MECHANISM

9.1 Swing Mechanism

In the case of proprietary slewing rings, it is particularly important that the manufacturer is consulted and given full details of the loads and duty involved. Attention shall be given to the method of mounting and the bolting requirements for which the manufacturer's recommendations shall be taken into account. **(Mod.)**

10. POWER PLANT

10.1 General

Add following to this Clause:

10.1.4 Electric motors

Electric Motors as the prime mover shall comply with the requirements of IEC.

10.1.5 Internal combustion engines

Internal combustion engines shall comply with the requirements of IPS-M-PM-290 and a silencer shall be fitted to the exhaust.

10.1.6 Lubricating system

The sump and lubricating system of the engine shall be so arranged that efficient lubrication is

maintained in all planes of operation covered by the specification.

10.1.7 Draining system

Provision shall be made where necessary for draining the water circulating system, the drain cocks being fitted in accessible positions. The arrangement shall be such that it is not possible to leave pockets of water in either the system or the pump casing.

10.2 Exhaust Systems of Internal Combustion Prime Movers

10.2.2 Exhaust Systems

When practicable the exhaust from an engine should be discharged vertically as high as possible, and it is recommended that means should be provided to prevent the ingress of water into the exhaust system. **(Mod.)**

10.3 Fuel Tanks

10.3.3 Fuel tank capacity

Fuel tank capacity shall be sufficient for at least 8 hours running on normal crane duty, and means shall be provided for ascertaining the quantity of fuel contained in the tank. **(Add.)**

10.4 Hazardous Area Classifications

For cranes which are to be permanently installed, the hazard of earthquake effects appropriate to the site or zone should be considered. **(Mod.)**

11. CONTROLS

11.5 Control Equipment

Circuit-breakers, contactors, relays and similar control equipment shall be of sound construction, adequate for the duty concerned. Electrical, and where practical mechanical, interlocking shall be incorporated to prevent closure of the main circuit-breaker or contactor unless the control gear for all individual subsidiary circuits is in the "open" or neutral position. A push-button emergency stop or stops, placed readily available for prompt use by the operator in emergency, shall be connected either in the operating coil-circuit of the main contactor or in the under-voltage release circuit of the main circuit-breaker, as appropriate. All fuses, except for local low current control circuits, shall be of HR cartridge type. **(Add.)**

12. CABS AND ENCLOSURES

12.1 General

Cab lighting, either natural or artificial, shall provide a level of illumination that enables the operator to observe the operating controls. The operator’s cab shall be mounted on the rotating portion of the crane and have safe access to the driver’s cabin.

Cab shall be self ventilated by means of adjustable opening and in case of special environmental condition shall be equipped with heating and/or Cooling System. Free height inside cab shall not be less than 2 meters. Cab shall be provided with door lockable from outside and with emergency escape opening. **(Mod.)**

12.2 Windows

A windshield wiper should be provided on the front window. Means shall be provided for cleaning windows from inside the cab unless exterior platforms are provided. **(Mod.)**

12.8 Seat

An adjustable operator's seat with backrest shall be provided. The seat should be arranged and constructed to minimize operator fatigue, and shall have means for ventilation. **(Add.)**

12.9 Radio Communications

Operator cab shall be equipped with radio communication facilities to enable the operator to contact the vessel and control board intermediately. **(Add.)**

12.10 Safe Load Indicator

a) A safe load indicator shall be supplied for hoist services, and shall be located in the operator's cabin so as to give unimpaired vision of the load line.

b) The indicator shall display the safe working load at any radius relative to see state, the weight on the hook, the operating radius, and the actual load expressed as a percentage of the rated load at that radius.

c) A visual alarm shall warn when the percentage rated load exceeds 95 percent, and audible alarm shall warn when the rated load reaches 110 percent.

d) The audible alarm shall be located outside the driver's compartment and shall be powerful enough to be heard at a distance of 100 meters in the most adverse crane operating conditions.

e) The safe load indicator shall be calibrated to show the platform lifting duty, and for the duty when lifting from supply vessel. Vendor should state load indicator weight accuracy, which shall be within ±5 percent. **(Add.)**

13. MISCELLANEOUS REQUIREMENTS & EQUIPMENT

13.1 Boom Equipment

13.1.5 The connections between the sections of lattice strut jibs and sections of fly jibs shall be designed so that they can only be disconnected by an operator standing out from under the section. This may be achieved by the use of pins which can only be inserted from inside the jib so that an operator must stand outside of the jib to drive them out. **(Add.)**

13.3 Clutch and Brake Protection

Clutches shall be arranged to permit adjustments where necessary to compensate for wear. **(Mod.)**

13.9 Miscellaneous Equipment

13.9.1 Tool box

A metal receptacle should be provided for the storage of small hand tools and lubricating equipment. It should be secured in the cab or on the machinery platform. **(Mod.)**

13.9.2 Hydraulic circuit pressure

Relief valves shall be provided in hydraulic and pneumatic circuits carrying fluid pressurized by a power driven pump in order to limit the maximum pressure in the circuit. The magnitude of the relief settings shall permit operation under rated load conditions, and means shall be provided to prevent unauthorized adjustment or tampering. A hydraulic circuit diagram shall be provided in the manufacturer's handbook. **(Mod.)**

13.9.4 Audible warning device

Delete, "when specified by the purchaser". **(Mod.)**

Add following Paragraphs to this Clause.

13.9.6 Fire extinguisher

A class ABC portable fire extinguisher shall be provided in the cab, or at the machinery housing.

13.9.7 Cooler

A cooler shall be fitted, if required, to keep the temperature of the fluid within the limits specified by the fluid supplier.

13.9.8 Wind velocity indicator

A wind velocity indicating device shall be mounted at or near the top of the crane.

A velocity read-out shall be provided at the operator's station in the cab, and a visible or audible alarm shall be triggered in the cab and at remote control stations when a preset wind velocity has been exceeded.

13.9.9 Weight of the hook(s)/ block (s)

The weight of the hook(s) / block(s) shall be clearly and durably marked on them.

13.9.10 Fuel tank filler pipes

Fuel tank filler pipes shall be located and or protected so as not to allow spillage or overflow to run onto the engine, exhaust, or electrical equipment of the machine being fueled.

13.9.11 Necessary lightings

The crans shall be supplied with all necessary lightings both inside driver's cab and outside, to allow the operation of the crane even during night time. Furthermore, lamps shall be provided to allow good illumination during inspection and maintenance works.

13.10 Painting and Protective Coating

The unit shall be coated in accordance with manufacturer's standard practice, subject to approve by Purchaser. The final color of supplied equipment shall be agreed mutually upon by the Purchaser and the Vendor. **(Add.)**

17. MARKING

Following information shall be included in Nameplate:

- Crane classification ……
- Order No. ……
- Order placed by……
- Loading capacity ……
- Weight of complete crane ……
- Heaviest removeable part for overhaul. ……

(Mod.)

18. DOCUMENTATION (Add.)

18.1 Each crane shall be provided with informational literature written in English including, but not limited to the following.

a) Installation preparation instructions which should provide:

1) Vertical and horizontal forces and torsional and overturning moments applicable to each recommended configuration. The data should indicate whether governing forces are due to in-service or out-of-service winds, the applicable wind velocity, and whether the wind has been taken perpendicular or diagonal to the crane boom head.

2) Data or boom height limitations based on several wind velocity levels for out-of-service conditions.

3) Anchorage arrangements.

4) Crane dimensional data.

b) Erection and dismantling instructions which should provide:

1) Weight and dimensions for components and subassemblies.

2) Recommended lifting attachment points.

3) Center of gravity location for nonuniform components and subassemblies.

4) The method and recommended sequence of assembly and disassembly of components and subassemblies. Warnings should be given alerting erection personnel when member strength or stability requires particular methods or sequencing.

5) Details, including diagrams where necessary, of critical component connections describing and identifying bolts, pins, and other parts needed, the method of assembling the joint, the torque or tension to be applied to prestressed (traction) bolts, the point in time of the erection process for applying torque or tension, and the means for retaining pins, and etc.

c) Operating instructions, limitations, and precautions.

d) Maintenance requirements and recommendations including identification of those members or locations that should be periodically observed, or tested, for the purpose of detecting the onset of metal fatigue, the loosening of prestressed (traction) bolts, or wear affecting the ability of the crane to support rated loads.

e) Repair recommendations including advice on welding procedures. The type of metal used for load sustaining members shall be identified (see Section 13).

f) Design characteristics affecting safety, such as:

1) Location, proper settings and adjustments, and functioning of limiting and indicating devices.

2) Permitted variations in electrical supply and circuit parameters.

3) Location and required settings of hydraulic or pneumatic pressure relief valves and locations of points where circuit pressures can be checked.

4) Limitations on service life of load bearing members or mechanisms including manufacturer's recommendations of frequency of inspection as a function of severity of service.

g) Lifting speeds, and operating speeds for all motions, stated for all conditions and configurations.

h) Full specification of transmission systems and controls including actuating medium, e.g., air, hydraulic, hydrostatic, electric, mechanical, etc.

i) Specification of brakes and clutches, torque converters, hydraulic pumps, rams, etc.

j) Any unusual maintenance or servicing procedure unique to the crane. **(Add.)**

18.2 Erection and Maintenance Instructions

The manufacturer shall supply full operational instructions, erection and dismantling instructions, maintenance instructions, aparts manual and, where appropriate, a workshop manual. **(Add.)**

18.3 Spare Parts

Recommended spare parts identified by Part No's for two years of continuous operation, including price list shall be submitted in vendor proposals. Vendor proposal for spare parts shall include proposed method of protection from corrosion during shipment and subsequent storage. Recommended spare parts for commissioning shall also be submitted. **(Add.)**

19. PREPARATION FOR SHIPMENT **(Add.)**

19.1 Equipment shall be suitably prepared for the type of shipment specified. The preparation shall be mutually agreed upon and unless otherwise specified, shall make the equipment suitable for 12 months of outdoor storage from the time of shipment. **(Add.)**

19.2 The Vendor shall provide the Purchaser with the instructions necessary to preserve the integrity of the storage preparation after the equipment arrives at the job site and before start-up. **(Add.)**

19.3 One copy and original electronic file of the manufacturer's standard installation instructions shall be packed and shipped with the equipment. **(Add.)**

20. GUARANTEE AND WARRANTY **(Add.)**

Unless exception is recorded by the Vendor in his proposal, it shall be understood that the vendor agrees to the following guarantees and warranties:

- During a period of 12 months after the date of commissioning, The vendor shall, with all possible speed and without cost to the purchaser, replace or repair the goods or any part there of found to be defective due to faulty material, workmanship or to any act or omission of the Vendor.

- In the particular the Vendor shall reimburse any transportation and other charges incurred by the Purchaser in effecting such replacement or repair at the point of use. **(Add.)**

APPENDICES

APPENDIX F - DATA SHEET (Add.)

	DATA SHEET OFFSHORE CRANE							PROJECT NO.			ORDER NO.	
1		SERVICE									ITEM	
2		No.REQD		TYPE							MR	
3		MODEL						MANUFACTURER				
4												
5		**ENVIRONMENTAL DATA**						**OPERATING DATA**				
6												
7		OPERATING TEMP:						TYPE:				
8		MAX.EXPOSED SURFACE TEMP:										
9								LIFTING CAPACITY:				
10		MAX. WIND SPEED: OPERATING										
11		STOWED						RADIUS (m)	No. OF FAILS	LOAD (kg)		
12		WIND PRESSURE:										
13												
14												
15												
16												
17												
18		WAVE HEIGHT:										
19												
20		WAVE PERIOD:										
21								LIFTING HEIGHT:				
22												
23		AREA CLASSIFICATION:						ELEVATION OF BOOM FOOT PIN:				
24		BOOM										
25		DRIVER'S CABIN						OPERATING SPEEDS:				
26		PEDESTAL						LIFTING				
27		ELECTRICAL EQPT.						STEWING				
28								LUFFING				
29												
30								SLEWING ANGLE:				
31								LUFFING ANGLE:				
32								LUFFING Max. INCLINATION:				
33												
34		**CONSTRUCTION DATA**										
35												
36		DESIGN CODES:										
37												
38		PRIME MOVER TYPE:						MOTOR POWER:				
39												
40		BOOM TYPE:						BOOM LENGTH:				
41		TIP LENGTH:										
42		LIFTING RADIUS: MIN.:										
43		MAX.:										
44												
45		OVERTURNING MOMENT:										
46												
47		HOOK TYPE:				MATERIAL:				SAFETY LATCH:		
48												
49												
50		NOTES:										
51												
52												
53												
	REV		DESCRIPTION	DATE	PRD	CKD	APP	REV	DESCRIPTION	DATE	PRD	APP

(to be continued)

APPENDIX F - (continued)

	DATA SHEET OFFSHORE CRANE		PROJECT NO.	ORDER NO.
1				
2	DRUM / ROPE	BOOM HOIST	MAIN HOIST	AUXILIARY HOIST
3				
4	TYPE			
5	DIAMETER			
6	LENGTH			
7	MATERIAL			
8	PITCH /ROPE DIA.RATIO			
9	ROPE WRAPS			
10	GUIDING DEVICE			
11	ROPE SPOOLING DEVICE			
12	GROOVE RADIUS			
13	HEIGHT			
14	PITCH			
15	DRUM THICKNESS			
16	ROPE MFR			
17	NORMAL DIA.			
18	TYPE N* OF STRANDS			
19	CORE TYPE			
20	ELEMENTARY WIRE N* DIA.			
21	BREAKING LOAD			
22	SAFETY FACTOR			
23				
24				
25	HYDRAULIC UNIT:			
26	TANK CAPACITY			
27	PUMPS N* TYPE			
28	MOTOR POWER			
29	OPERATING /DESIGN PRESSURE			
30	ACCUMULATOR N* /VOLUME /PRESSURE			
31	HAND PUMP			
32				
33				
34	DRIVER'S CABIN			
35				
36				
37	**ACCESSORIES**			
38				
39	ANTICOLLISION DEVICE			
40	TYPE			
41	LOCATION			
42	CENTRALIZED LUBRICATION SYSTEM			
43	WALKWAYS /LADDERS /RAILS			
44	MATERIAL			
45	AIRCRAFT SAFETY LIGHTS			
46	TELECOM SYSTEM			
47	FIRE EXTINGUISHERS			
48	N* /TYPE			
49	OVERLOAD WARNING DEVICE			
50				
51	NOTES:			
52				
53				
54				

	REV	DESCRIPTION	DATE	PRD	CKD	APP	REV	DESCRIPTION	DATE	PRD	CKD	APP

(to be continued)

APPENDIX F - (continued)

	DATA SHEET OFFSHORE CRANE						PROJECT NO.				ORDER NO.
1		SHEAVES:									
2		DIAMETER									
3		MATERIAL									
4		BEAKING TYPE									
5		LUBRICATION									
6		SHEAVE GUARDS									
7											
8											
9		BRAKES:									
10		TYPE									
11		HOLDING TORQUE									
12											
13											
14		BOOM HOIST:									
15		TYPE									
16		HOISTING CAPACITY									
17		CPR (S)									
18		CPR (D)									
19		CPR (B)									
20		CPR ACTUAL									
21		GEARS DES. CODE									
22		BOOM HOLDING DEVICE TYPE									
23											
24											
25		SWING MECHANISM:									
26		BRAKE TYPE									
27		SWING LOCK									
28		BEARING TYPE									
29		SWING CIRCLE ASSEMBLY RETAINER									
30											
31											
32		MAIN HOIST:									
33		GEARING TYPE /MATERIAL									
34		TRANSMISSION RATIO									
35		DESIGN CODE /SERVICE FACTOR									
36		LUBRICATION SYSTEM									
37											
38											
39		AUXILIARY HOIST:									
40		GEARING TYPE /MATERIAL									
41		TRANSMISSION RATIO									
42		DESIGN CODE /SERVICE FACTOR									
43		LUBRICATION SYSTEM									
44											
45											
46											
47		NOTES:									
48											
49											
50											
51											
52											
53											
54											
	REV	DESCRIPTION	DATE	PRD	CKD	APP	REV	DESCRIPTION	DATE	PRD	CKD	APP

(to be continued)

APPENDIX F - (continued)

	DATA SHEET OFFSHORE CRANE						PROJECT NO.				ORDER NO.	
1		SERVICE				No.REQ'D.					ITEM	
2		MANUFACTURER:				TYPE:					Mk	
3		RATED kW AT SITE CONDITIONS:				rpm:					SERIAL No.	
4												
5		OPERATING DATA					CONSTRUCTION DATA					
6		STROKE: CYCLE:					CYLINDER: No. ARRANGEMENT:					
7		rpm: DESIGN /MAX /MIN / /					PISTONS: STROKE mm BORE mm					
8		MAX. CONTIUOUS kW (STD. COND'S):					No. OF RINGS:					
9		RATED kW (NET AT SITE COND): RATED rpm:					TOTAL DISPLACEMENT: cm^3					
10		BMEP AT WORKING CONDITIONS: kg /cm^2					VALVES: TYPE: No.					
11		FUEL TYPE:					MAIN BEARING: TYPE: No.					
12		FUEL CONSUMPTION: kg /kW h AT FULL LOAD					LENGTH: DIAM:					
13		kg /kW h AT $^3/_4$ LOAD					INJECTION SYSTEM:					
14		kg /kW h AT $^1/_2$ LOAD					SUPERCHARGING SYSTEM:					
15							STARTING TORQUE AVAIL.: kgm					
16		DRIVEN MACHINE: ITEM:					ROTATION (FROM COUPL. END):					
17		TYPE					SPEED GOVERNOR:					
18		BHP: DESIGN: kW MAX.: kW					TRANSMISSION:					
19		rpm										
20		ROTATION (FACING COUPLING END):					ACCESSORIES					
21							AIR INLET FILTER: MAKE TYPE No.					
22		SITE DATA AND UTILITIES					FUEL FILTER: MAKE TYPE No.					
23		INSTALLATION					EXHAUST SILENCER FLEX PIPE:					
24		ALTITUDE: m BAROMETER: kg /cm^2					BATTERY TYPE CAPACITY Ah:					
25		TEMPERATURE: SUMMER WINTER					BATTERY CHARGER:					
26		RET. HUMIDITY:					BASEPLATE:					
27		DESIGN CONDITION:					FUEL TRANSFER PUMP:					
28							MAINTENANCE TOOLS:					
29		EL.POWER					CONTROL PANEL:					
30							FUEL TANK: LIT.					
31		COOLING SYSTEM: TYPE:					INSTRUMENTS					
32		CIRC. WATER PUMP:					PRESS. GAGES: OIL: WATER:					
33		WATER COOLER					TEM. GAGES: OIL: WATER:					
34		ACCESSORIES:					FUEL LEVEL INDICATOR:					
35							TACHOMETER:					
36		LUBRICATION SYSTEM: TYPE:					ALARMS AND SHUTDOWNS:					
37		MAIN PUMPS: DRIVEN BY:					LOW OIL PRESS.: HIGH OIL TEMP.:					
38		AUX. PUMPS: DRIVEN BY:					HIGH WATER TEMP.: OVER SPEED:					
39		FILTER:					LOW FUEL LEVEL: LOW TENSION BATT.:					
40		OIL COOLER:										
41		OIL TYPE:					SHOP TEST:					
42		OIL CONSUMPTION:						REQUIRED	OBSERVED	WITNESS		
43		STARTING SYSTEM: TYPE:					MFR STD SHOP TEST					
44							PERFOR-MANCE TEST					
45		No. CONSECUTIVE STARTS:					NO LOAD TEST					
46												
47		MATERIALS:					WEIGHTS: MOTOR: kg ACC.: kg TOTAL: kg					
48		FRAME: VALVES: PISTON RINGS:										
49		CYLINDERS: CYLINDER HEAD: VALVE SEALS:										
50		PISTONS: CYLINDER LINERS:										
51		NOTES:										
52												
53												
	REV	DESCRIPTION	DATE	PRD	CKD	APP	REV	DESCRIPTION	DATE	PRD	CKD	APP

(to be continued)