

Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures

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Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures

1 Scope

1.1 Objective

This document provides guidelines and establishes recommended procedures for inspection, maintenance, and repair of items for drilling and well servicing structures, in order to maintain the serviceability of this equipment. The information in this document should be considered as supplemental to, and not as a substitute for, the manufacturer's instructions and the recommendations in API 54.

1.2 Structures Covered

Items of drilling and well servicing structures covered by this document include:

- masts/derricks and accessories;
- substructures and accessories.

NOTE 1 Crown block sheaves and bearings are covered under API 8B.

NOTE 2 Offshore derricks and their substructures and accessories are not under the scope of this document relative to 6.2.4, Category IV inspection requirements.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Specification 4F, *Drilling and Well Servicing Structures*

ASNT SNT-TC-1A, *Recommended Practice for Personnel Qualification and Certification in Non-Destructive Testing*

AWS D1.1, *Structural Welding Code*

ISO 9712, *Non-Destructive Testing—Qualification and Certification of NDT Personnel*

3 Terms, Definitions, Acronyms, and Abbreviations

For the purposes of this document, the following terms, definitions, acronyms, and abbreviated terms apply. In addition, terms and definitions given in API 4F apply. If identical terms are defined in API 4F and this document, the definitions in this document apply.

3.1 Terms and Definitions

3.1.1

certification

The act of endorsing as meeting set standards or requirements.

3.1.2**critical area**

A highly stressed region of a primary load-carrying component as defined by the manufacturer or a qualified person.

3.1.3**fish plate**

Either one or two steel plates that are welded or bolted to the webs or flanges of adjacent rails or beams on opposite sides to strengthen a member.

3.1.4**inspection**

Comparison of equipment conformity to predetermined standards, followed by a determination of action required, if any.

3.1.5**maintenance**

Actions, including inspection; adjustments; cleaning; lubrication; testing; and expendable parts replacement necessary to maintain the serviceability of the equipment.

3.1.6**manufacturer**

A term denoting individuals or companies who make or process equipment or materials covered by this standard.

3.1.7**owner**

An individual, legal entity or organization holding legal title to the equipment.

3.1.8**primary load**

The load which a structure is designed to resist during transportation, erection, survival or operation.

NOTE This can be dead load, hook load, rotary load, setback or rod load, environmental load, or a combination of these.

3.1.9**primary load carrying components**

Those components of the covered equipment through which the primary load is carried.

3.1.10**qualified person**

A person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training, or experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the subject.

3.1.11**serviceability**

The condition of a piece of equipment at any point in time that affects the ability of the equipment to perform its function(s) as intended.

3.1.12**testing**

Actions that are carried out on a piece of equipment to determine if it can perform a required function.

3.1.13

turn-of-nut method

Procedure whereby the specified pretension in high-strength bolts is achieved by rotating the fastener component a predetermined amount after the bolt has been snug tightened.

3.1.14

users

Individuals or companies responsible for the use of equipment or material, or implementing recommended practices.

3.2 Acronyms and Abbreviations

ASNT	American Society of Nondestructive Testing
AWS	American Welding Society
CWI	Certified Welding Inspector
H ₂ S	hydrogen sulfide
IPS	improved plow steel
IWRC	independent wire rope core
MPI (MT)	magnetic particle inspection
NDT	nondestructive testing
OEM	original equipment manufacturer
PT	liquid penetrant
RT	radiographic testing
SWL	safe working load
UT	ultrasonic testing

4 General Principles

4.1 Procedures

4.1.1 General

Users/owners should establish written procedures for inspection, maintenance, and repair of each item of equipment or may utilize the written recommendations from the equipment manufacturer. Actions may be initiated based on, but not limited to, one or more of the following criteria:

- specific time intervals;
- measurable wear limits;
- non-performance of equipment;
- environment;
- experience (history);
- regulatory requirements;
- equipment damaging incident.

4.1.2 User/Owner Procedure Development

If the manufacturer of the equipment no longer exists or is unable for any reason to provide suitable recommendations, the user/owner should develop inspection, maintenance and repair procedures using applicable API and/or industry recommended practices and standards.

4.1.3 Background Information

Assembly drawings, drawings identifying critical areas, and acceptance criteria should be made available to the inspector for a Category IV inspection. In the absence of assembly or critical area drawings, or both, all areas of primary load carrying components shall be considered critical. This data shall be used by the inspector to adapt the inspection procedure. In addition, the users/owners may provide the history of repair, if available.

4.2 Personnel Qualifications

4.2.1 General

Inspection, maintenance, and repair procedures should be carried out by a person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training, or experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the subject. Inspectors should be familiar with the type of equipment to be evaluated.

4.2.2 Welder Performance Qualifications

Welders on derrick and mast repairs shall be certified in accordance with AWS D1.1 or equivalent and should have experience in mast/derrick maintenance. All welding completed should be in accordance with the requirements of AWS D1.1 or equivalent.

4.2.3 Category II Inspections

Personnel undertaking Category II inspections will be individuals designated by the owner/user company who have adequate experience and knowledge in masts/derricks. These individuals will typically be experienced field superintendents, engineers, or rig supervisory personnel.

4.2.4 Category III Inspections

The responsible individual conducting the Category III inspection shall be a qualified person and possess adequate knowledge, including knowledge of the primary load path and critical components, and experience in the inspection criteria specified for Category III inspections in 6.2.3 and as set forth in 4.2.1.

Typical qualified persons performing the inspection under the responsible individual may include engineers, original equipment manufacturer (OEM) technicians, nondestructive testing (NDT) technicians, senior operations person (rig superintendent, rig manager, or operations management), provided they meet the qualification criteria for their specific role in the inspection.

The responsible individual should engage other qualified individuals as necessary.

4.2.5 Category IV Inspections

The Category IV inspection should be conducted by or closely supervised by a Professional Engineer, OEM representative or other manufacturer of drilling structures authorized representative. In addition, Category IV inspectors should satisfy the requirements of Category III inspectors.

The NDT inspectors for a Category IV inspection shall be required, as a minimum, to have certification as an ASNT Level II Technician per ASNT specification SNT-TC-1A, ISO 9712, or an equivalent standard.

Personnel performing Category IV visual inspection of welds shall be qualified and certified as follows:

- AWS certified welding inspector (CWI) or equivalent; or
- an engineer or technician who, by training or experience, or both, in metals fabrication, inspection, and testing, is qualified to perform inspection of the work.

4.3 Training

Proper training of personnel continues to be one of the most critical considerations in the care of a masts/derricks. This includes the rig personnel, mechanics, and welders, as well as the individuals providing inspection. Field personnel should be trained to conduct visual inspections as required for Category, I, II and III inspections. Training programs will assist field personnel to identify existing problems and ensure that all equipment involved will operate in the manner for which it was designed.

5 Use and Maintenance

5.1 General

Maintenance of equipment consists of actions such as adjustments, cleaning, lubrication, and replacement of expendable parts. The complexity of these activities and the safety risk involved should be considered in the assignment of appropriate resources such as facilities and equipment.

In addition to the procedures developed in accordance with 4.1, the manufacturer should define any special tools, materials, measuring and inspection equipment, and personnel qualifications necessary to perform the maintenance.

The manufacturer has used care in design and selection of material for the drilling or well servicing structure. The structure should give satisfactory performance when used within the stipulated load capacities and in accordance with instructions. Every crew member involved in erecting and lowering the structure should be given instructions and training in those operations they are directly involved in.

5.2 Loading

The safe operation of drilling and well servicing structures depends on whether the foundation is adequate for the load imposed (see Section 11). Environmental and dynamic loads should be considered. The design load for foundation requirements should be the sum of the weight of the drilling or well servicing structure, the weight of the machinery and equipment on it, the maximum hook or rotary load of the structure, forces due to external guywire loading, and the maximum setback load (see Section 15).

During erecting and lowering operations utilizing the rig drawworks, the slowest practical line speed should be used.

Loads due to impact, jarring, acceleration, and deceleration may be indicated by fluctuation of the weight indicator. The operator should keep the indicator readings within the nameplate hook load capacity rating.

Some rig designs require that the mast base structure be restrained against uplift from the application of mast hook load.

5.3 Bolted Structure

5.3.1 General

Each part of a bolted structure is designed to carry its share of the load. Parts omitted or improperly placed may contribute to the failure of the structure. During erection of bolted structures, bolts should be left loose enough, in way of erection, to allow proper fit of adjacent mast/derrick members without distortion and locked in stress. This procedure permits correct alignment of the structure, which results in proper load distribution. At completion of erection, all bolts should be checked for proper torque. Periodically, all bolts should be checked for proper torque.

Suitable instructions regarding the proper installation of clamps, pins and bolts used for tie downs shall be developed for existing structures by a qualified person utilizing manufacturer's guidelines when available. Tie down components incorporating bolts which are expected to be tensioned multiple times shall be designed with specified pretension no greater than 50 % of the bolt material minimum ultimate strength times its nominal cross-sectional area. Clamp installation instructions shall include pretension values and tolerances. Bolt tensioning shall be achieved using calibrated tensioning methods. Bolts that are specified to be pretensioned to a higher value than 50 % of the bolt material minimum ultimate strength shall only be used once.

The length of bolts shall be such that the end of the bolt will be flush with or outside the face of the nut when properly installed.

While it may be the responsibility of the manufacturer to give guidelines on erection and bolt installation, it is the responsibility of those performing the actual work that are accountable.

5.3.2 Bolt Pretensioning

The use of the turn-of-nut method is always acceptable for use on bolts which are not to be reused. Reuse of bolts is acceptable if it is specified in the manufacturer's instructions or by a Professional Engineer. This method yields a more consistent pretension without the need for calibration. The *Specification for Structural Joints Using High-Strength Bolts* as prepared by the RCSC Committee may be used as a reference.

5.4 Racking Platforms

A well-constructed pipe racking support, which is designed to prevent pipe from falling, should be provided in the mast/derrick. Pipe-racking fingers should be kept straight and secured with a safety device. The working platform should be made of a nonskid material and should not extend into the travel path of the hook and block, swivel, top drive system, and motion compensator. If the platform is not constructed of nonskid material, it may be applied to the surface as necessary.

Fall protection should be properly secured and provided at all times.

Racking platforms may be made of special high-strength steel; care should be taken to ensure that equivalent metals are used in repair.

5.5 Changes in Rig Location

When a rig is moved to a new environment, the rig should be reviewed by a qualified person to ensure that the structures meet all required design criteria and structural safety level requirements for the new environment.

6 Inspection

6.1 General

The objective of these inspections is to detect defects.

NOTE Inspections do not require nameplates.

The existence of cracks or mechanical damage can indicate severe deterioration and impending failure. Their detection, identification, and evaluation require accurate inspection.

Prompt attention may be required to determine if it is necessary to remove the equipment from service immediately or to conduct the appropriate repair.

Caution—To prevent further unforeseen structural damage, any significant manufacturing defects discovered should be repaired or replaced and reported to the manufacturer.

The following routine checks as applicable should be made at the appropriate intervals.

- a) Inspect all welds, particularly in erecting mechanism, for cracks.
- b) Inspect erecting mechanism for any other signs of deformity.
- c) Follow the manufacturer's instructions when checking hydraulic circuits and when bleeding air from scoping and raising rams before each raising and lowering operation. Make sure there is an adequate supply of hydraulic fluid. Precautions should be taken to remove all air from the hydraulic system.
- d) Hydraulic cylinders, pipework, and hoses should be checked for leaks. Seals and hoses should be checked for cracks or wear, or both. Repair of hydraulic cylinders should always be done by qualified personnel.
- e) Wire rope, including operating lines, raising lines, and guylines, should be inspected for kinks, broken wires, or other damage. Make certain that guylines are not fouled and that other lines are in place in sheave grooves before and during each raising or lowering operation.
- f) Check load transfer mechanisms, guides and scoping ram stabilizers in telescoping masts for free operation and good condition before raising or lowering operation. Keep mechanisms and guides clean and properly lubricated. Make sure scoping ram stabilizers move into proper positions as the top section is telescoped up. After the top section is scoped into the working position, check to see that the load transfer mechanisms are fully engaged.
- g) Check unit for level and check foundation and supports for correct placement before erecting operation. Level the unit in accordance with manufacture's recommendations.
- h) Check wear and lubrication of crown sheaves.
- i) Check lubrication and condition of bearings in all sheaves, sprockets, pins, etc., which are part of the erection mechanism.
- j) Check folding ladders for proper position prior to access by personnel and for free operation before lowering operation.
- k) During drilling or servicing operation, make scheduled inspections of all bolted connections to ensure that they are tight.

- l) Load transfer mechanisms should be checked frequently for proper locking position, preferably on each tour during operations. Where possible, the load transfer mechanism should have a positive lock to prevent disengagement. To develop its rated load capacity, the axis of the structure must be in alignment throughout its length. It is important that load transfer mechanisms be maintained in such condition as to ensure structure alignment. It is suggested to paint the load transfer mechanisms a bright, contrasting color in order to assist rig personnel in locating and inspecting these items.

6.2 Inspection Categories

6.2.1 Category I

Visual observation of the mast/derrick and substructure by rig personnel during operations for indications of inadequate performance.

6.2.2 Category II

Category I inspection plus a more thorough inspection of, but not limited to, load bearing areas and sheaves for cracks, damage, corrosion, loose or missing components and premature wear. This more detailed inspection should be performed during rig up operations.

6.2.3 Category III

A thorough visual inspection of all load bearing components and members shall be conducted to determine the condition of the mast/derrick or substructure, or both, and documented on the checklist in Annex A, Annex B, Annex C, or Annex D as applicable. Inspections on well servicing, truck or trailer mounted masts should include observation of rig up/rig down operations.

Inspection results from Category III inspections shall be documented and maintained (see 9.1) in the permanent rig file.

6.2.4 Category IV

A Category IV inspection shall include the requirements of a Category III inspection and the following requirements:

- a) Critical joints shall be subject to nondestructive examination.
- b) All equipment shall be disassembled and cleaned to the extent necessary to conduct NDT of all defined critical areas.
- c) All welds (100 %) shall be visually examined.
- d) All welds in critical areas shall be inspected using magnetic particle inspection (MPI/MT), liquid penetrant (PT), radiographic testing (RT), or ultrasonic testing (UT) in accordance with AWS D1.1. Eddy current inspection is an accepted alternative method to inspect welds in critical areas. A MPI/PT method shall be used to evaluate indications identified with eddy current. Welds on galvanized structures may require different inspection techniques and intervals. Cracks are generally identified through visual inspection on a galvanized mast/derrick.
- e) An ultrasonic thickness test or other recognized method shall be used to test for internal corrosion on tubular members used as primary load carrying components. Internal cameras, usually run on cable, may also be used to visually inspect for internal corrosion.

Inspection results from Category IV inspections shall be documented and maintained (see 9.1) in the permanent rig file.

6.3 Frequency of Inspection

The user/owner of the equipment should develop schedules of inspection. The schedules should be based on experience, the manufacturer's recommendations, and one or more of the following factors:

- environment;
- load cycles;
- regulatory requirements;
- operating time;
- testing;
- repairs.

The minimum inspection types and frequencies in Table 1 and Table 2 are recommended for drilling structures and well servicing structures in use during the specified period(s), respectively.

Table 1—Inspection Types and Frequencies for Drilling Structures

Category	Frequency	Documentation
I	Daily	Optional
II	At Rig Up	Optional
III	Every 730 operating days ^a	Equipment File
IV	Every 3650 operating days ^a	Equipment File
^a One operating day equals 24 accumulated operating hours from spud to rig release.		

Table 2—Inspection Types and Frequencies for Well Servicing Structures

Category	Frequency	Documentation
I	Daily	Optional
II	At Rig Up	Optional
III	Every 730 operating days or 3 calendar years (whichever comes first) ^{a,b}	Equipment File
IV	Every 3650 operating days or 13 calendar years (whichever comes first) ^{a,b}	Equipment File
^a One operating day equals 24 operating hours. One operating hour is any time the well servicing rig is rigged up and performing operations, when the mast is in the raised position on a well servicing unit, and a field crew is on location, irrespective of what type of operation is being performed.		
^b One calendar year is 365 days.		

In corrosive environments (humidity, salt, H₂S, etc.), an increase in the inspection frequency should be considered. This would include checking for internal corrosion on tubular style members on a more expedited schedule.

Mast/derricks and substructures on mobile offshore drilling units (including drillships, semi-submersibles, or jack-ups) shall be exempt from the requirements of a Category IV inspection. Category IV inspections shall be required for rigs that are disassembled for transport from one drilling location to another drilling location, such as those used on fixed platforms or tension-leg platforms.

The beginning of the inspection frequency period shall start on the first spud of a structure and shall be reset after the highest applicable category inspection is performed. The time remaining until a structure's next inspection shall not be affected by the issuance of a new revision of API 4F.

6.4 Acceptance Criteria

Acceptance criteria should be established based on experience and manufacturer's recommendations. Worn equipment that does not meet the acceptance criteria should not be accepted for operation.

6.5 Rejected Equipment

Rejected equipment shall be marked and removed from service.

6.6 Damage Classification

Damage identified during inspection shall be classified as follows:

- X1—damage which requires immediate attention.
- X2—damage which requires attention at the time of the next rig move.
- X3—damage which requires attention during next maintenance.
- X4—damage which requires attention prior to the next Category III inspection.

7 Repair

7.1 General

Structural repair of a drilling or well servicing structure shall be carefully planned prior to initiating work. The manufacturer or qualified person (see 4.2.1) shall be consulted for approval of materials and methods, utilizing accepted engineering practices to supervise the required repairs.

The following recommendations shall be followed when undertaking structural repairs of a drilling or well servicing structure.

- a) Repair or replace any damaged members in accordance with Table 3.
- b) Use welding procedures approved by the manufacturer or the qualified person directing the repairs or modifications. Drilling and well servicing structures may use high-strength steel, which require specific welding electrodes and welding techniques.
- c) Fixtures and accessories are preferably attached to structures by means of suitable clamps or bolted foundations.
- d) Do not drill or burn any holes in any members or perform any welding without first obtaining approval of the manufacturer or the qualified person, as applicable.
- e) Girts, braces, and other members shall always be in place when the structure is under load.

Table 3—Inspection Criteria

Deviation	Rejection Criteria
Legs	1/4 in. (6.4 mm) bow in 10 ft (3 m)
Braces	1/2 in. (12.7 mm) bow in 10 ft (3 m)
Overall alignment of structure	3/4 in. (19.1 mm) out of square
Pins	1/16 in. (1.6 mm) under specified diameter
Pin holes (I.D.)	3/16 in. (4.8 mm) over specified pin diameter (for pins less than 3 in. [76.2 mm] diameter)
	1/4 in. (6.4 mm) over specified pin diameter (for pins 3 in. [76.2 mm] diameter or greater)
Corrosion	10 % reduction in cross sectional area
Structural members and wire rope	Sharp kink or bend in a local area
Connections and fittings	Loose connections or fittings
Bolts, pins and safety keys	Missing components or assemblies
Structural members	Missing members
Sheaves, rollers, and bearings	Do not turn freely, have cracks detected, sheave groove out of gage, or groove depth greater than allowed by sheave manufacturer
Structural members	Line cuts or abrasions from wire rope
Exposure to heat	In excess of 500 °F (260 °C)
NOTE Components displaying deviations should be considered for repair/replacement. This list is for guidance only. Specific components may have different rejection criteria based on OEM specifications.	

- f) All damage may be repaired in the field. Major damage should be repaired in a shop-like environment and in accordance with the OEM or equivalent specifications.
- g) Replacement materials, pins, and bolts should meet OEM specifications or equivalent.

7.2 Corrosion

As a guideline, corrosion damage reducing the cross-sectional area of a member of more than 10 % (or percentage measured tolerance based on manufacturer's recommendation) should be considered for repair. Corroded areas should be abrasive blasted or mechanically cleaned to sound metal, evaluated, and repaired by one of the following methods:

- fill pockets/cavities with weld metal and grind flush;
- fish plate the damaged region and seal weld or remove the damaged area and re-plate;
- replace the entire member.

Following repair, the entire area should be recoated.

7.3 Fire and Heat Exposure

Following an exposure to temperatures exceeding 500 °F (260 °C), the affected areas of the structure should be inspected for distortion. Exposure to heat, above the critical temperature of the grade of steel, warrants further examination of the affected area by a qualified person.

8 Modification/Change in Rating

8.1 Planning

Structural modification of a drilling or well servicing structure should be carefully planned prior to initiating work. The manufacturer should be consulted for approval of materials and methods. In absence of the manufacturer's approval, the services of a qualified person (see 4.2.1) utilizing accepted engineering practices should be employed to supervise the required repairs or modification, or both.

When undertaking structural modifications of a drilling or well servicing structure, use welding procedures approved by the manufacturer or the qualified person directing the repairs or modifications as applicable. Drilling and well servicing structures may use high strength steel, which requires specific welding electrodes and welding techniques.

8.2 Design and Modification

The designer of modifications to drilling structures shall account for the impact of such modifications on operating capacities, environmental loads, erection loads, transportation loads, lifting loads, structural overturning and foundation requirements, and other conditions as may be applicable. Fabrication associated with such modifications shall be done under the governance of a qualified quality assurance program in accordance with the instructions of the designer of the modifications.

Design modification and fabrication shall be performed by a qualified person(s).

For modifications of any crowns, derricks, masts, or substructures, the API standard in place at the time of manufacture or more recent shall be used and agreed upon between the user and designer of modifications.

Fixtures and accessories are preferably attached to structures by means of suitable clamps or bolted foundations. Do not drill, weld, or burn any member without first obtaining approval of the manufacturer or a qualified person.

8.3 Padeyes

Padeyes mounted on structural members or beneath crown frames should be designed and fabricated in accordance with API 4F. It is recommended that padeyes be identified with a safe working load (SWL) rating. Holes should be machine made. Welds should be NDT.

8.4 Lifting Eyes

Drilling rig masts incur the most damage when they are being handled. The use of lifting eyes will greatly reduce damage. Lifting eyes should be designed in accordance with API 4F. Lifting eyes are the designated position at which the mast should be handled by a crane or gin pole truck. Each lifting eye should be designed to bear a given load. The lifting eyes on a mast should be clearly marked and personnel should be made aware of their importance. Figure 1 provides some typical lug designs, which may be employed at the designated lifting eyes following the mast inspection. These schematics are provided for reference only and actual designs and placement shall be designed by a qualified person.

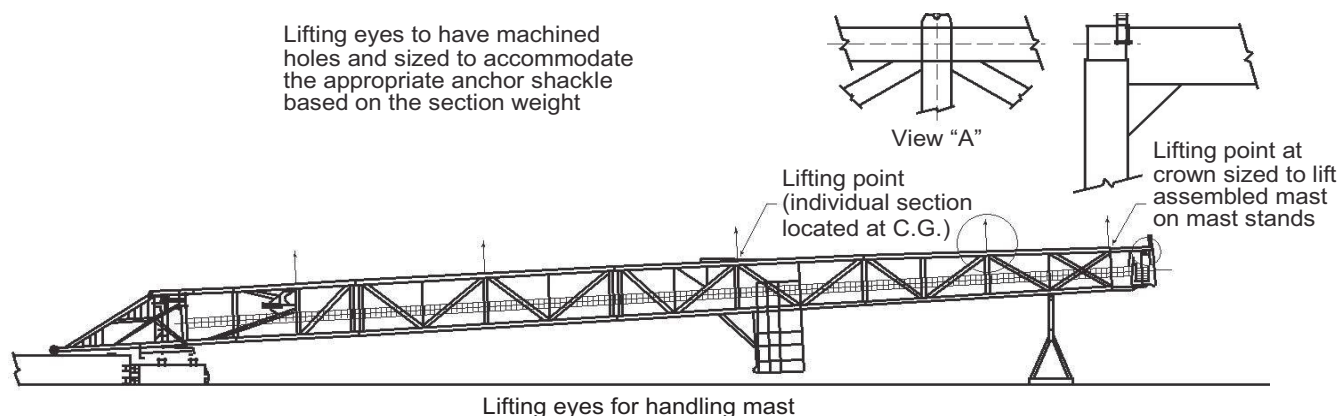


Figure 1—Typical Mast Lifting Lugs

8.5 Nameplates For a Modification/Change in Rating

Drilling and well servicing structures modified in accordance with this standard shall have the modifications identified by a nameplate. The original manufacturer's nameplate shall not be removed. A nameplate created for a modification shall not bear the API Monogram mark. A nameplate that reports the details of a modification shall contain the information as per the specification and edition used for that analysis, as well as the date of the modification, including month and year. The manufacturer of the modification shall provide the nameplate in accordance with 9.2. Markings shall be either raised or stamped. The nameplate shall be securely affixed to the structure in a conspicuous place near the original nameplate.

9 Documentation and Records

9.1 Inspection and Repair Records

The user/owner should maintain and retain an equipment file containing pertinent information regarding the mast and substructure. Electronic records are permissible. The file should include the following.

- a) Records of Category III and Category IV inspections. Annex A, Annex B, Annex C, and Annex D include forms which may be useful for documentation of these inspections.
- b) Description of mast/derrick and or substructure including the following:
 - 1) type and style, serial number, PSL and specifications;
 - 2) name of manufacturer and date of manufacture;
 - 3) clear height;
 - 4) maximum rated static hook load, in pounds, with guylines if applicable, for stated number of lines to traveling block;
 - 5) maximum combined rated static rotary and rated setback capacity on substructure;
 - 6) list of components and assembly drawings; critical areas should be clearly defined.
- c) Documentation of all repairs or modifications should be retained, and may include the following:
 - 1) complete documented results of any inspection reports;
 - 2) date and documentation of all repairs performed;

- 3) significant defects (type, dimensions) reported;
- 4) location and extent of repairs;
- 5) NDT methods and results;
- 6) primary load carrying components replaced or modified;
- 7) date and location of repairs;
- 8) copy of NDT inspection;
- 9) copy of NDT inspectors and welders' qualifications;
- 10) material certifications and traceability as applicable;
- 11) assembly drawings and documentation of all modifications;
- 12) the date and the name of the qualified person(s) involved in the inspection, maintenance, repair or modification.

9.2 Identification/Traceability

Equipment serial number or identification markings provided by the manufacturer should be maintained on the equipment. Replacement of missing nameplates should be controlled and issued by the manufacturer.

Identification of equipment should be verified by the manufacturer in order to replace a missing nameplate.

Identification markings should be provided by the user/owner for unidentified equipment. Serial numbers or identification markings should be recorded and retained.

9.2.1 Nameplate

Masts and derricks should have a permanent nameplate attached to the structure indicating the following:

- name of manufacturer;
- model number and serial number, rating including static hook load capacity with number of lines strung to the traveling block;
- if guying is applicable, denote the recommended guying patterns as per the requirements of Section 13.

9.2.1.1 Masts and Derricks

Masts and derricks shall have a permanent nameplate attached to the structure indicating the following:

- name of manufacturer;
- model number and serial number;
- rating including static hook load capacity with number of lines strung to the traveling block.
- if guying is applicable, denote the recommended guying patterns as per the requirements of Section 13.
- the following text: CAUTION—Acceleration or impact, also setback, rods, and wind loads will reduce the maximum rated static hook load capacity.

9.2.1.2 Substructures

Substructures shall have a permanent nameplate attached to the structure indicating the following:

- name of manufacturer;
- model number and serial number;
- combined rotary and setback capacity.

9.2.1.3 Service Rig Masts

Service rig masts shall have a permanent nameplate attached to the structure indicating the following:

- name of manufacturer;
- model number and serial number;
- rating including static hook load capacity with number of lines strung to the traveling block;
- if guying is applicable, denote the recommended guying patterns as per the requirements of Section 13;
- mast setup distance for mast with guylines, m (ft).
- the following text: CAUTION—Acceleration or impact, also setback, rods, and wind loads will reduce the maximum rated static hook load capacity.

9.2.1.4 Crown Block Assembly Nameplate Information (Required Only for Crown Block Assemblies for Use with Derricks)

Crown block assemblies shall have a permanent nameplate attached to the structure indicating the following:

- name of manufacturer;
- model number and serial number;
- rating including static hook load capacity with number of lines strung to the traveling block.

9.2.2 Substructures

Substructures should have a permanent nameplate attached to the structure indicating the following:

- name of manufacturer;
- model number and serial number;
- combined rotary and setback capacity.