



Mobile **Rig**
Refurbishment
& Recertification



The Ultimate Engineering Hub...

ACCURACY. SPEED. FLEXIBILITY



Oil & Gas Services

Mobile Rig Refurbishment

Singh & Company's (SAC) Heavy Engineering Division is a fully equipped manufacturing facility with state of the art machinery, our primary focus is maintenance, refurbishment and recertification services for the global oilfield service industry. We provide refurbishment for all kinds of drilling and workover rigs of all models. We also provide all kinds of maintenance services, whether its a simple cleaning, repair, new paint or a complete rebuild, Our team of selected engineers, 6G rig welders, structural / pipe fabricators can complete refurbishment work with limited downtime for the customer either in our own facility or at site.

Standard Mobile Rig Refurbishment

- Disassembly of complete rig (carrier and mast)
- Disassembly of all assemblies
- Steam cleaning, sand blasting and painting of complete rig.
- AESC Category IV/CAODC Level IV Inspection and repair of mast, per SAC work instruction
- Reassembly of assemblies and rig with new standard parts
- Rig-up and final inspection
- Licensed Engineer's stamped and certified letter

Inclusive Mobile Rig Refurbishment

- Disassembly of complete rig (carrier and mast).
- Disassembly of all assemblies.
- AESC Category IV/CAODC Level IV Inspection and repair of mast, per SAC work, without limitations to scope of work, exceptions to include:
 - Mast replacement, if condemned.
 - Complete replacement of main legs.
 - If condemned, SAC will disassemble and perform Category IV/CAODC Level IV Inspection and repair on one additional customer-supplied mast at no additional charge to customer for costs incurred on original mast inspection.
 - If required, replacement mast will be quoted separately and the customer will only be billed for expenses incurred to their mast prior to being condemned.
- Steam cleaning, sand blasting and painting of complete rig.
- Reassembly of assemblies and rig with new standard parts.
- Rig-up and final inspection.
- Licensed Engineer's stamped and certified letter.



Parts List

Standard Parts

Bearing; Seals; Rubber Goods (Excluding Tires); Friction Materials; Brake Linkage (including refurbished brake bands); Roller Chains; Hydraulic and Pneumatic Valves; Electrical; Hose; Fittings; Hardware; Fluids; Labels; Minor Metal Cosmetics to Decking; Handrails; Guards.

Premium Parts

Shafts; Gears; Sprockets; Clutch Hard Parts; Hydromatic Hard Parts; Brake Rims; Drum Spool or Lebus Grooving; Crown Sheaves; New Brake Bands; Hydraulic and Pneumatic Cylinders and Major Components; Major Under-Carriage Repair / Replacement; Tires and Wheels; Assemblies (Air Compressors, Winches, PTO, Hydraulic Pumps, Etc.); Cabs; Frame Repairs/ Replacement; Major Metal Cosmetics/ Replacement of Decking; Handrails; Guards

Mobile Rig Refurbishment

Mast Inspection and Repair as per AESC Category IV/CAODC Level IV

Scope of Work

- Complete disassembly and reassembly of customer supplied mast (not including removal from carrier)
- Replacement of 10 or less diagonal braces in each mast section (upper and lower) if required
- Replacement of 10 feet of leg material or less in each mast section (upper and lower) if required
- Repairs, as required (not including complete replacement of any assemblies) for the following:
 - Rod basket (including activation system, re-spacing, finger safety chains, etc.)
 - Tubing board (including activation system, escape door, finger safety chains, etc.)
 - Crown (including bearings, seals, bushings, NDT of sheaves (not including sheave replacement unless customer supplied)
 - Base Section (including load and/or tilt screw and nut replacement)
 - Ladder
 - Locking system
 - Scoping ram expendables (packing, guide rings, hardware, etc.)
 - Miscellaneous (guy line hooks, air and hydraulic plumbing, hinge ears and pins, brackets, block cradle, lubrication, etc.)
- Sand blast and Paint to customer specifications
- NDT Inspection and repairs within compliance of AESC Category IV/CAODC Level IV Specifications

Not Included

- Installation
- Includes mounting mast on customer-supplied carriers, squaring, leveling, bleeding, hydraulic rams, raising and scoping masts, verifying stabilizer and lock operation (Base, other than pinning up, and headache installation not included)
- Raising ram repair or replacement
- Work floor repair or replacement
- Operator's platform repair or replacement Charge for Ultrasonic Testing (UT) of leg thickness.

BEFORE



AFTER



BEFORE



AFTER



BEFORE



AFTER



Is your rig over pulled?

In tight holes or stuck pipe situations, the operator must know how much additional tension, or pull, can be applied to the string before exceeding the yield strength of the drill pipe. This is known as Overpull, since it is the pull force over the weight of the string. For example, in a vertical hole with 12 ppg mud, a drillstring consists of 600 feet of 7.25-inch x 2.25-inch drill collars and 6,000 ft of 5-inch, New Grade E drill pipe with a nominal weight of 19.5 lbs/ft and an approximate weight of 20.89 lbs/ft.

First, the hookload is determined

Hookload = Air Weight x Buoyancy Factor

= [(6,000 x 20.89) + (600 x 127)] 0.817

= 164,658 pounds

Referring to the API RP 7G, the yield strength in pounds for this grade, class, size and nominal weight of drill pipe is 395,595 pounds. Therefore:

Maximum Overpull = Yield Strength In Pounds - Hookload

= 395,595 - 164,658

= 230,937 pounds



The operator can pull 230,937 pounds over the hookload before reaching the limit of elastic deformation (yield strength). Obviously, as depth increases, hookload increases, at a certain depth the hookload will equal the yield strength (in pounds) for the drill pipe in use. This depth can be thought of as the maximum depth that can be reached without causing permanent elongation of the drill pipe (disregarding hole drag as a consideration). Practically, an operator would never intend to reach this limit. A considerable safety factor is always included to allow for overpull caused by expected hole drag, tight hole conditions or a stuck drillstring.

Case Study 01:

One of our client came up with an accidental rig for recertification. The rig was twisted and damaged because of over pulling. The material was immediately ordered and all the QA/QC inspections were carried out with our internal documented procedures. A repair procedure was developed soon after. The rig was repaired and recertified as per API 4F/4G standards to work at its original rated capacity.

Blowout

A blowout is the uncontrolled release of crude oil and/or natural gas from an oil well or gas well after pressure control systems have failed. Well blowouts can occur during the drilling phase, during well testing, during well completion, during production, or during workover activities.

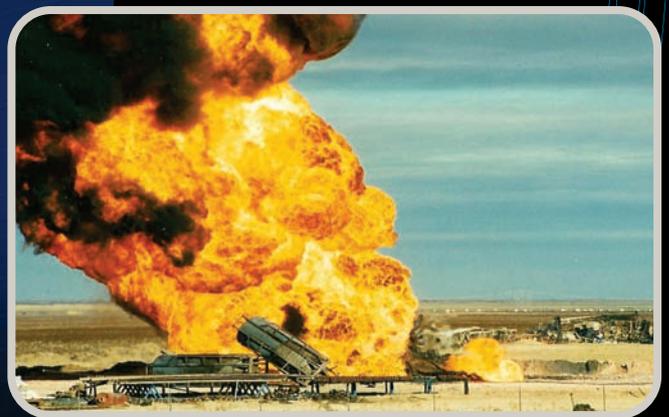
Surface Blowouts

Blowouts can eject the drill string out of the well, and the force of the escaping fluid can be strong enough to damage the drilling rig. In addition to oil, the output of a well blowout might include sand, mud, rocks, drilling fluid, natural gas, water, and other substances.

Blowouts will often be ignited by an ignition source, from sparks from rocks being ejected, or simply from heat generated by friction. A well control company will then need to extinguish the well fire or cap the well, and replace the casing head and hangars. The flowing gas may contain poisonous hydrogen sulfide and the oil operator might decide to ignite the stream to convert this to less hazardous substances.



Sometimes, blowouts can be so forceful that they cannot be directly brought under control from the surface, particularly if there is so much energy in the flowing zone that it does not deplete significantly over the course of a blowout. In such cases, other wells (called relief wells) may be drilled to intersect the well or pocket, in order to allow kill-weight fluids to be introduced at depth. When first drilled in the 1930s relief wells were drilled to inject water into the main drill well hole. Contrary to what might be inferred from the term, such wells generally are not used to help relieve pressure using multiple outlets from the blowout zone.



Case Study 02:

We got a repair job of a rig that was damaged because of blow out. The rig was twisted, burned and broken from many places. We needed to do welding work, fabrication & paint jobs. Our engineers developed a repair procedure, required material was ordered immediately. We carried out all the QA/QC inspection with our documented procedures. The rig was repaired and recertified in minimum downtime.

Welding Cracks

Cracks and planar discontinuities are some of the most dangerous, especially if they are subject to fatigue loading conditions. There are several different types of cracks like:

- Arc strike cracking
- Cold cracking
- Crater crack
- Fusion-line crack
- Hat crack
- Hot cracking
- Underbead crack
- Longitudinal crack
- Reheat cracking
- Root & toe cracks

They must be removed by grinding back (if superficial) or repaired by welding. Cracks can occur in the weld itself, the base metal, or the heat affected zone (HAZ). Longitudinal cracks run along the direction of the weld and are usually caused by a weld metal hardness problem. This type of cracking is commonly caused by a cooling problem, the elements in the weld cooling at different rates. Cold cracking occurs after the weld metal has had the chance to completely solidify. It is caused by highly restrained welds, shrinkage and discontinuities. Cold cracks can be prevented by preheating the weldment, welding towards areas of less constraint as well as using more ductile weld metal. They can be repaired by removing and re-welding the elements together.



The reliability and safe operation of Oil & Gas infrastructure is heavily dependent on the structural integrity of its welded joints. Design and specification of fatigue crack repairs is a specialized process. A badly designed or poorly executed weld repair is unlikely to survive as long as the original joint. We can provide guidance on the most appropriate repair methods, assist in devising method statements and advise on possible design improvements.

Case Study 03:

We got a job to repair weld cracks of a rig from one of our clients. After carrying out all the QA/QC inspections, our engineers developed a repair procedure. The Welding was carried out successfully by our 6G certified welders. NDT procedures were carried out after the weld repairs followed by a radiography test on site. The rig was given a “go ahead” to start the production soon after.

Rig Recertification

As global demand for oil grows, the petroleum industry is under increasing pressure to expand exploration and drilling operations. Many oil companies are capitalizing on relaxed government restrictions and technological advances to maximize production.

Workover Rigs and lifting devices need to be recertified on a regular basis AND/OR after any accident that may have an impact on the structural integrity of the unit. Being in this line from last many years, SAC offers recertification services to its customers for API 4F equipment. Our engineers have experience with inspection and certification of rigs and lifting equipment, and also with field repairs and shop repairs when equipment has been damaged. We also assist drilling companies with design and implementation of field repairs to damaged drilling equipment to allow the rigs to be certified and return to work. Wherever necessary we can design and carry out the repairs using locally available resources as well.

Our primary focus is workover rig maintenance and related services. We can also provide complete rig packages for manufacturing of mobile rigs from start to finish. We have a full staff of experienced rig welders, fabricators, licensed site engineers who can be deployed to the field on a short moment's notice. For support we have a large manufacturing and maintenance facility who can provide services 24 x 7.

Being an operator of these equipments, We understand the urgency to get the equipment back to work. Our engineers can perform the necessary calculations to establish a safe working rated capacity until more permanent repairs can be carried out.

Facilities:

- Muscat x 4
- Sohar x 1
- Nizwa x 1
- Rusayl x 1



***For Inquiries please contact us
on (+968) - 24- 590463
or Email at oilandgas@singhandco.com***

CERTIFICATE OF REGISTRATION
SINGH & COMPANY

ADDRESS: P.O. BOX 2138, P. C. 111, CPO SEEB, MUSCAT, SULTANATE OF OMAN
 Compliance No. QA / EA / 1911

ISO 9001:2008

MANUFACTURING AND REPAIRING OF MECHANICAL COMPONENTS, FABRICATIONS & REPAIRING OF OVERHEAD MECHANICAL EQUIPMENT, MANUFACTURING & REPAIRING OF BURNER HOLES TOOLS, DESIGN & FABRICATING OF PRESSURE VESSELS, PROCESS PIPING, TANKS, STEEL STRUCTURE, DESIGN & FABRICATION OF BURNER, WELDING & WORKOVER RIGS, FLOW OIL & GAS SERVICES

EA 1718

Compliance Issue Date: 27th June 2012
 Compliance Expiry Date: 27th June 2015
 Date of initial registration: 27th June 2012
 Re-issuance period: 3 Years

General Manager
 Lutfi Muneer M. Al-JAZ



CERTIFICATE OF REGISTRATION
SINGH & COMPANY

ADDRESS: P.O. BOX 2138, P. C. 111, CPO SEEB, MUSCAT, SULTANATE OF OMAN
 Compliance No. QA/EA/0891907

ISO 14001:2004

MANUFACTURING AND REPAIRING OF MECHANICAL COMPONENTS, FABRICATIONS & REPAIRING OF OVERHEAD MECHANICAL EQUIPMENT, MANUFACTURING & REPAIRING OF BURNER HOLES TOOLS, DESIGN & FABRICATING OF PRESSURE VESSELS, PROCESS PIPING, TANKS, STEEL STRUCTURE, DESIGN & FABRICATION OF BURNER, WELDING & WORKOVER RIGS, FLOW OIL & GAS SERVICES

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General Manager
 Lutfi Muneer M. Al-JAZ



CERTIFICATE OF REGISTRATION
SINGH & COMPANY

ADDRESS: P.O. BOX 2138, P. C. 111, CPO SEEB, MUSCAT, SULTANATE OF OMAN
 Compliance No. QA/EA/0891908

OHSAS 18001: 2007

MANUFACTURING AND REPAIRING OF MECHANICAL COMPONENTS, FABRICATIONS & REPAIRING OF OVERHEAD MECHANICAL EQUIPMENT, MANUFACTURING & REPAIRING OF BURNER HOLES TOOLS, DESIGN & FABRICATING OF PRESSURE VESSELS, PROCESS PIPING, TANKS, STEEL STRUCTURE, DESIGN & FABRICATION OF BURNER, WELDING & WORKOVER RIGS, FLOW OIL & GAS SERVICES

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INTERNATIONAL ASSOCIATION OF DRILLING CONTRACTORS

MEMBER

SINGH AND COMPANY

is an Associate member
in good standing.

International Association
Of Drilling Contractors
2013

I MECH E

Institution of Mechanical Engineers

This is to certify that application submitted by
SINGH AND COMPANY

meets the initial professional development requirements of the Institution of mechanical engineers and the Engineering Council and has been accredited from
12/02/2013
FOR A PERIOD OF 2 YEAR

Chief Executive

Institution of MECHANICAL ENGINEERS
Improving the world through engineering

THE WELDING & JOINING SOCIETY

THIS IS TO CERTIFY THAT
SINGH AND COMPANY

WAS ELECTED AS A
CORPORATE MEMBER
OF THE
SOCIETY ON
15 JANUARY 2013



CERTIFICATE OF AUTHORIZATION

The named company is authorized by the American Society of Mechanical Engineers (ASME) to the scope of activity shown below in accordance with the applicable rules of the ASME Boiler and Pressure Vessel Code. The use of the authorization mark and the authority granted by the Certificate of Authorization are subject to the provisions of the agreement set forth in the application. Any contractor stamped with this authorization mark shall have been fully verified in accordance with the provisions of the ASME Boiler and Pressure Vessel Code.

COMPANY: Singh & Company LLC, Heavy Engineering Division, Building No. 11, Al Ataya Street, Ghala Industrial Estate, Muscat 111, Oman

SCOPE: Manufacture of pressure vessels at the above location and field sites controlled by the above location (This authorization does not cover integrated graphics)

AUTHORIZED: December 19, 2012
 EXPIRES: December 19, 2015
 CERTIFICATE NUMBER: 44,302

By: *Eyad Al-Jaz*
 Vice President, Conformity Assessment

By: *Jahid*
 Director, Conformity Assessment

The American Society of Mechanical Engineers

THE NATIONAL BOARD OF BOILER & PRESSURE VESSEL INSPECTORS

Certificate of Authorization

This is to certify that
SINGH & COMPANY LLC
HEAVY ENGINEERING DIVISION
BUILDING NO. 11, AL ATAYA STREET
GHALA INDUSTRIAL ESTATE
MUSCAT, OMAN

is authorized to use the "NB" symbol in accordance with the provisions of the National Board.

The scope of Authorization is limited as follows:
METALLIC REPAIRS AND/OR ALTERATIONS AT THE ABOVE LOCATION AND EXTENDED FIELD REPAIRS AND/OR ALTERATIONS CONTROLLED BY THIS LOCATION

CERTIFICATE NUMBER: 8-808
 ISSUE DATE: JANUARY 3, 2013
 EXPIRATION DATE: DECEMBER 19, 2013



Certificate of Authority to use the Official API Monogram
License Number: 6A-1305 ORIGINAL

The American Petroleum Institute hereby grants to
SINGH & COMPANY LLC
Plot No. 1612
Ghala Industrial Area
Muscat
Sultanate of Oman

the right to use the Official API Monogram™ on manufactured products under the conditions in the official publications of the American Petroleum Institute without API Spec Q1™ and API Spec 6A, and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: 6A-1305

The American Petroleum Institute reserves the right to monitor this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following products: Casing and Tubing Hangers, Cross-Over Connectors, Tubing Head Adapters, Top Connectors, Tees and Crosses, Adapter and Spigot Spools, Casing and Tubing Hangers, Flanged Connectors, Threaded Connectors, Other End Connectors at PSL 1 through 3, Bubbler (PSS not applicable), Valve Manual Plugs (PSS not applicable)

OHS Exclusions: No Exclusions Identified as Applicable

Effective Date: FEBRUARY 24, 2012
 Expiration Date: FEBRUARY 24, 2015

To verify the authenticity of this license, go to www.api.org/compass.html.




American Petroleum Institute
Jahid
 Director, Conformity Assessment

Certificate of Authority to use the Official API Monogram
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Muscat
Sultanate of Oman

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The American Petroleum Institute reserves the right to monitor this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following: Drilling Spools, Adapters, Loose Connections

OHS Exclusions: No Exclusions Identified as Applicable

Effective Date: FEBRUARY 24, 2012
 Expiration Date: FEBRUARY 24, 2015

To verify the authenticity of this license, go to www.api.org/compass.html.




American Petroleum Institute
Jahid
 Director, Conformity Assessment

Certificate of Authority to use the Official API Monogram
License Number: 7-1-0961 ORIGINAL

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Muscat
Sultanate of Oman

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The American Petroleum Institute reserves the right to monitor this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following products: Drill Stem Subs; Drill Collars; Threading for Rotary Shouldered Connections

OHS Exclusions: No Exclusions Identified as Applicable

Effective Date: FEBRUARY 24, 2012
 Expiration Date: FEBRUARY 24, 2015

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License Number: 4F-0291 ORIGINAL

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Muscat
Sultanate of Oman

the right to use the Official API Monogram™ on manufactured products under the conditions in the official publications of the American Petroleum Institute without API Spec Q1™ and API Spec 4F, and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: 4F-0291

The American Petroleum Institute reserves the right to monitor this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following products: Derricks, Masts, Crown Block Assemblies, Substructures at PSL 1 and 2

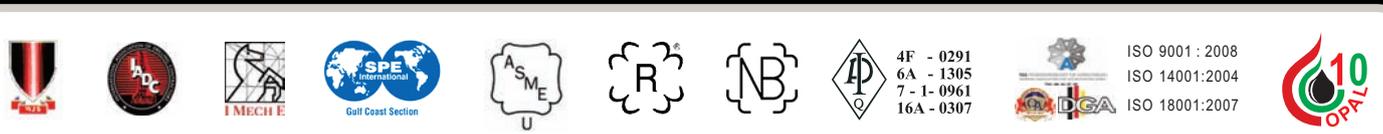
OHS Exclusions: No Exclusions Identified as Applicable

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American Petroleum Institute
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 Director, Conformity Assessment



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