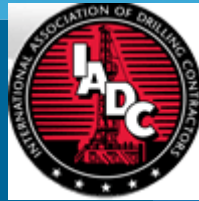


# Fundamental of Maintaining Equipment Integrity

Presentation  
for



**Well Control Asia Pacific 2009 Conference & Exhibition,  
18-19 November**

# STSA

## STSA Pte Ltd

Formerly known as Stork Technology Services Asia Pte Ltd  
No. 22 Jalan Terusan, Singapore 619299  
Tel: (65) 62651900 Fax: (65) 62621868

# Scope of Presentation

1. Welcome
2. Brief Introduction of STSA
3. Best Practices - BOP maintenance
4. General Footage

# Brief Introduction of STSA

STSA Pte Ltd is a large Singaporean facility specializing in Manufacturing, Re-manufacturing and Repairing of high pressure well control equipment.

STSA Pte Ltd is an authorised repair workshop for OEMs but also works directly with drilling contractors.

More than 30 years of in-house experience of working with **blowout preventers** of all sizes and makes, using state-of-the-art equipment and machines, 38T overhead cranes

Quality Program is API-Q1 (7th Edition) specs 16A and 6A and ISO 9001-2000 accredited.

# Brief Introduction of STSA

- STSA Pte Ltd handles more than hundred Blow Out Preventers (BOP) a year of various sizes from 13 5/8"-5K to 18 3/4"-15K.
- Customer base is mainly the drilling contractors in Asia Pacific region. STSA is the single source vendor for contractors, such as Transocean, Diamond Offshore and Seadrill
- All repair facilities are the state of the art CNC machines with any average age 2.8 years.
- STSA's staff has an average of 7years tenure.
- To establish run and operate a proper re-manufacture facility for BOPs is extremely costly. Entrance threshold high.



Best practices, from repair-shop point of view.

# Practices: Repair Service Providers:

## Type of repair services offered:

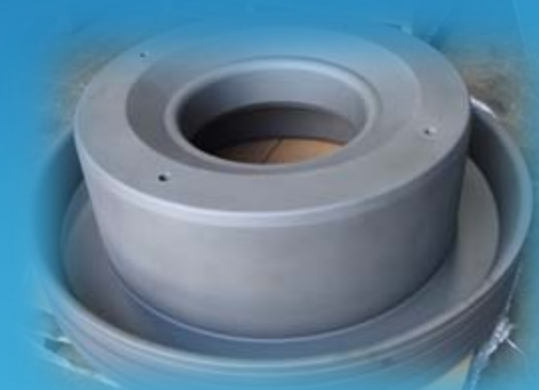
- Working Class repair
  - First Class repair
- } Choice of reconditioning method

## • Typical work scope of working class repair:

- Inspection
- Dress up, polish, re-tap studded, lock screw holes
- Blast, prime and paint
- Test

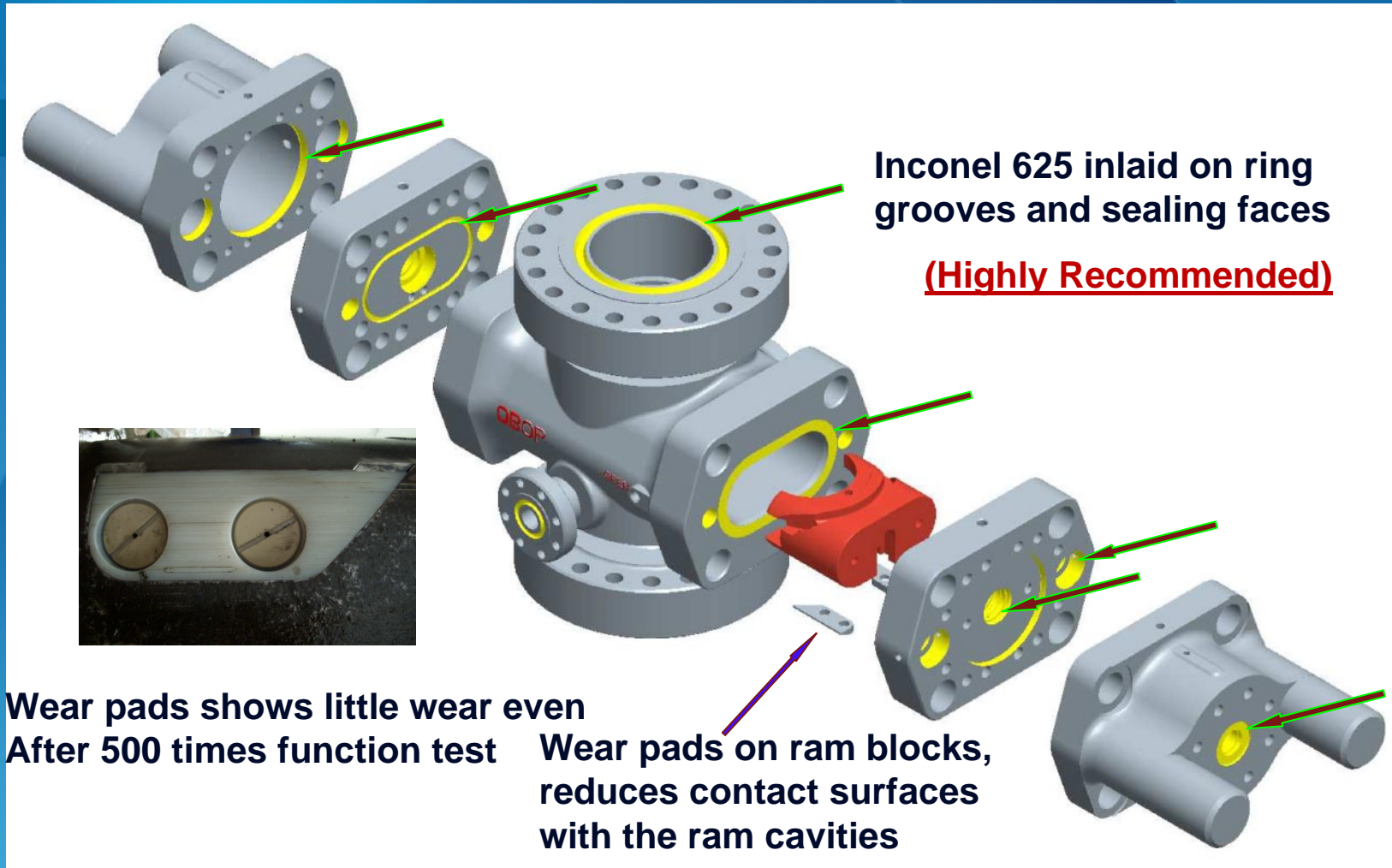
## • Typical work scope of first class repair:

- Inspection
- 100% weld repair (inconel, SS, or base-metal inlaid),
- PWHT
- Final machine to spec
- Complete Dress up, and polish
- Xylan coating internal
- Blast prime Paint
- Inspection, Test



# STSA's scope of work: First class repair during Recertification

- Incorporates improved repair schemes



# Basic Maintenance when in Operation

## Maintenance Work (when not in use, movement between wells):

Open up BOP, clean, inspect operating system, wellbore and ram cavity and grease BOP

Remove rubber seals, gaskets, and ram packers

Grease and protect ram blocks (when not in use).



## Annual Maintenance

Open up BOP

Clean all parts.

Replace all rubber seals, gaskets.

Repair/ replace all damaged metal parts.

Reassemble BOP

Test the ram and operating system





# Basic Maintenance when in Operation

## Maintenance Work

Test BOP and its shear ram

Inspect wellbore and ram cavity



Samples hydraulics fluid for test - bacteria contamination for test.



# Recommended Practice: Preservation

A procedure to assure corrosion protection if the equipment is placed onshore awaiting offshore shipment, or temporarily stored packaging, stocking and shipping

Procedures:

Disassemble BOP

Clean

Perform visual and dimensional inspection.

Apply anti rust and general purpose grease on the ram cavities.

Apply Moly Paste 51049 or equivalent for all bonnet bolt threads and close the bonnets.

Fill all hydraulic system with preservative fluid and plug all hydraulic holes.

Clean and paint exterior

Protect all outlets with plywood prior to shipment.



## Testing of Shaffer 18 3/4" SRAM BOP:

Video on Shearing of 5" Drill pipe: Change in Drill pipe material specification: employment of Boosters



# Pressure and Wellbore Testing of BOP

Live Testing in progress.....

WebCam:  
Qualification of QBOP –  
Stripping Test in Progress API spec 16A, section 4.7.3.4

# STSA

# Thank You



American Petroleum Institute



## Certificate of Authority to use the Official API Monogram

License Number: 16A-0081

ORIGINAL

The American Petroleum Institute hereby grants to

**STORK TECHNOLOGY SERVICES ASIA PTE LTD**  
22 Jalan Terusan  
Singapore  
Singapore

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 16A** 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: **16A-0081**

The American Petroleum Institute reserves the right to revoke 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: Manufacture of Ram BOP, Drilling Spools, Adapters

QMS Exclusions: No Exclusions Identified as Applicable

Effective Date: **APRIL 7, 2008**  
Expiration Date: **MARCH 11, 2010**

American Petroleum Institute

Director of Certification Programs



## Certificate of Registration

APIQR® REGISTRATION NUMBER

**0497**

*This certifies that the quality management system of*

**STORK TECHNOLOGY SERVICES ASIA PTE LTD**  
22 Jalan Terusan  
Singapore  
Singapore

*has been assessed by the American Petroleum Institute Quality Registrar (APIQR) and found it to be in conformance with the following quality system standard.*

**ISO 9001:2000**

*The scope of this registration and the approved quality management system applies to the*

**Design, Manufacture, Repair and Service of High Pressure Drilling Equipment and Machinery under IAF Scope Category 17**

*APIQR approves the organization's justification for excluding the following section(s) of ISO 9001:2000:*

**None Identified**

**EFFECTIVE DATE: May 9, 2005**

APIQR ISO 9001/2 Registrant since: N/A

Manager of Operations, APIQR



Participation in this evaluation indicates validity and retention is valid as long as the above registered organization continually meets all the requirements of APIQR's Registration Program and the requirements of the Registration agreement. Appropriate maintenance and records are used through annual full scope audits. Performance factors regarding the scope of the certificate and the approach to ISO 9001:2000 registration is not to be obtained by merely copying the required organization. This certificate has been issued from APIQR offices in Washington, D.C., USA. To verify the authenticity of this certificate, go to [www.apiqr.org/registration](http://www.apiqr.org/registration).



STSA Pte Ltd  
No. 22 Jalan Terusan, Singapore 619299  
Tel: (65) 62651900 Fax: (65) 62621868