

	Title:	Blowout Preventer Maintenance Program	Document #:	PMP-1-1
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1.0 PURPOSE

The purpose of this program is to mitigate any risks involved with Blowout Preventers after certain periods of use or inactivity, as well as before a failure occurs in a drilling emergency. (Refer to API 16A, 6A, & STD 53)

2.0 RESPONSIBILITY

It is the responsibility of equipment owner to ensure all personnel operating the Blowout Preventers are properly trained on use and safety.

3.0 RECOMMENDED MAINTENANCE FOR ANNULAR BOP'S

3.1.1 Monthly

- 3.1.1.1 All BOP's should be inspected for anomalies and accumulation of medium deposits on a regular basis as per below by rig personnel.
 - 3.1.1.1.1 Function test sealing elements in any Annular BOP daily in order to wipe the piston clean of any medium.
 - 3.1.1.1.2 Avoid cement from setting by rinsing the BOP with water and performing several function tests. If water alone will not remove the cement, remove upper housing or lid for cleaning.
 - 3.1.1.1.3 Check all nuts and studs for damaged threads by visual inspection ^{STD 53}.
 - 3.1.1.1.4 Visually inspect any readily visible BOP components for excess wear (Min. 1/8" in. wear for bore)
 - 3.1.1.1.5 Visually inspect the packing or sealing element for cracks, chunking, or splitting.
 - 3.1.1.1.6 Replace sealing or packing element if required.
 - 3.1.1.1.7 Perform every time prior to putting into operational service on the wellhead ^{STD 53}.

3.1.2 Yearly

- 3.1.2.1 All BOP's should be inspected yearly in anticipation for the 3-year maintenance. The yearly inspection goes deeper in scope than the monthly maintenance and is to be performed by rig personnel or at
 - 3.1.2.1.1 Clean all ring grooves and visually inspect for dings and major scratches. It is recommended to perform a penetrant test of ring grooves. Document all findings.
 - 3.1.2.1.2 Check all nuts and studs for damaged threads by visual inspection ^{STD 53}.
 - 3.1.2.1.3 Remove upper housing or lid and clean all areas thoroughly with water. Emery cloth use is recommended for cleaning light corrosion and scratches.
 - 3.1.2.1.4 Inspect upper housing hemi sphere area for any deep scratches or dings. Inspect Lid of other model BOPs for any deep scratches or dings, including wear plate wear. Replace wear plate if needed. Penetrant test of hemisphere area recommended. Document all findings.

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3.1.2.1.5 Visually inspect bore areas and all seal areas of upper housing or lid for corrosion or pitting. Do not allow the bore to wear more than 1/8" in. oversize. Penetrant test recommended for all seal areas. Document all findings.

3.1.2.1.6 Lubricate and remove sealing or packing element and inspect for excess wear on ID, cracks, and or splitting. Replace if necessary.

3.1.2.1.7 Perform hydraulic pressure test and wellbore pressure test of low and high pressure at a minimum of 5 minutes. Document findings ^{STD 53}.

3.1.3 Three Years

3.1.3.1 All annular BOP's are to be scheduled a three-year maintenance program where Fabritech completely disassembles the BOP, cleans, and inspects the BOP. All elastomers/seals and sealing element/packing element are replaced, and parts are replaced or fixed as necessary. Dimensional inspection of the entire BOP components is performed, as well as hydraulic and wellbore pressure tests prior to factory acceptance and certification. Studs and nuts are replaced ^{STD 53}.

4.0 RECOMMENDED MAINTENANCE FOR RAM BOP'S

4.1.1 Daily

4.1.1.1 All ram BOP's should be inspected daily (When in service) for ram functionality as well as any leaks.

4.1.1.1.1 Perform low and high-pressure tests for a minimum of 5 minutes stabilized every time prior to putting into operational service on the wellhead ^{STD 53}.

4.1.2 Monthly

4.1.2.1 All ram BOP's should be tested monthly (When in service) with the following procedure

4.1.2.1.1 Perform wellbore and hydraulic pressure tests. Record all findings.

4.1.2.1.2 Check all nuts and studs for damaged threads by visual inspection ^{STD 53}.

4.1.2.1.3 If any leaks occur, ensure all bonnet bolts or door cap screws are properly torqued and perform wellbore and hydraulic pressure tests again. Record all findings.

4.1.2.1.4 Grease any hinges and or locking screws as needed.

4.1.3 Three-Month

4.1.3.1 Perform wellbore and hydraulic pressure tests and document any findings.

4.1.3.2 Inspect that the ram locking mechanisms are functional by locking and unlocking them by hand.

4.1.3.3 Open rams (Typically 1,500 PSI)

4.1.3.4 Bleed all hydraulic pressure to 0 PSI.

4.1.3.5 Open doors or bonnets and remove the ram blocks.

4.1.3.6 Inspect all threads on the body and chase with a tap if necessary.

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- 4.1.3.7 Check all nuts and studs for damaged threads by visual inspection ^{STD 53}.
- 4.1.3.8 Clean and inspect each ram block for any elastomer damage. Replace elastomers as needed.
- 4.1.3.9 Wash the inside of the BOP ram cavity and bore in anticipation for further inspection.
- 4.1.3.10 Remove all minor scratches and light corrosion with emery cloth.
- 4.1.3.11 Ensure that the bore is smooth and not worn more than 1/8" in. oversize (Radius). Send in to repair if needed.
- 4.1.3.12 Clean the sealing face on the body that mates with the door with emery cloth.
- 4.1.3.13 Inspect shafts or operating piston buttons for any pitting or scratches that are visible. Send in to repair if needed.
- 4.1.3.14 Inspect operating piston or locking shaft for cracks or any bent areas. Send in to repair if needed.
- 4.1.3.15 Replace door or bonnet assembly seal (Racetrack seal) and inspect groove on intermediate flange or door. Smooth out small pitting with emery cloth. Replace seals as needed.
 - 4.1.3.15.1 Reinstall ram blocks and perform hydraulic pressure test and wellbore pressure test of low and high pressure at a minimum of 5 minutes. Document findings' ⁵³.
- 4.1.3.16

4.1.4 Yearly

- 4.1.4.1 Yearly maintenance should be performed by Fabritech in order to evaluate the extent of wear and schedule a major overhaul prior to failing and consists of the following:
 - 4.1.4.1.1 Check all nuts and studs for damaged threads by visual inspection ^{STD 53}.
 - 4.1.4.1.2 Wellbore and hydraulic pressure test.
 - 4.1.4.1.3 Dimensional inspection of ram cavity and through bore.
 - 4.1.4.1.4 Evaluation and determination of when to schedule major overhaul.

4.1.5 Three-year

- 4.1.5.1 All Ram BOP's are to be scheduled a three-year maintenance program where Fabritech completely disassembles the BOP, cleans, and inspects the BOP. All elastomers/seals are replaced, and parts are replaced or fixed as necessary. Dimensional inspection of the entire BOP components is performed, as well as hydraulic and wellbore pressure tests prior to factory acceptance and certification. Studs and nuts are replaced ^{STD 53}.

5.0 Extra information

- 5.1 BOP elastomers that experience an emergency event and are exposed to sour gas well shall be replaced.
- 5.2 It is recommended to replace all elastomers for BOP's if it has been in storage for 6 months.



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