END-OF-COURSE PAPER COILED TUBING EQUIPMENT 5

1. We experience a severe leak below the Shear/Seal BOP with the Coiled Tubing at a depth of 12,000 ft. What action[s] should we take?

   a) Close the Slip and Pipe Rams and then kill the well
   b) Close the Annular BOP and then kill the well
   c) Close the Down Hole Safety Valve
   d) Pick up 10 to 20 ft, operate the Shear/Seal BOP and then close the Upper Master Gate Valve on the Xmas Tree

2. During a BOP test, we observe fluid coming from one of the the weep holes on the Quad BOPs. What action[s] should we take?

   a) One or more ram shaft seals are leaking. This BOP should be repaired or replaced and then retested before proceeding with CT operations
   b) It seems a plug is missing. Obtain the appropriate manufacturer's threaded plug, close the weep hole and re-test the BOPs
   c) No action is required. If the hydraulic system cannot maintain pressure, we can lock the rams instead, which will prevent any leakage from the rams
   d) One or more ram shaft seals are leaking. Energize the emergency seal by squeezing plastic. Re-test the BOP before proceeding with CT operations

3. What is the purpose of a deployment system?

   a) To run and retrieve a long BHA into the well in section, while the well is under pressure
   b) To inject the Coiled Tubing into the well
   c) This is another term used for the mobilization of the Coiled Tubing Unit to the assigned location
   d) To provide a [extra] long lubricator for a long Bottom Hole Assembly

4. In which of the following situations would the Shear Ram of the Quad or Combi BOP be capable of shearing the items across the BOP?

   a) The Bottom Hole Assembly and any other components we intend to run
   b) The Coiled Tubing we intend to run along with any wireline that may be run inside it
   c) The Coiled Tubing we intend to run
   d) The Coiled Tubing we intend to run along with any perforation gun that may be suspended below it

5. When would it be necessary to change Pipe Rams?
TWO ANSWERS

a) When rigging up on a new and different well
b) When changing Coiled Tubing size
c) When the Pipe Rams are damaged, worn or do not hold pressure
d) When the elastomers change colour
e) Six-monthly

6. Why is it important to have the traction on the Injector Head set correctly?
TWO ANSWERS

a) To ensure that the Coiled Tubing does not buckle
b) To ensure that the coil is not forced out of the well
c) To ensure that the Coiled Tubing is gripped properly, without causing damage as a result of slippage
d) To ensure that chain tension is correct

7. We have rigging up all of the Coiled Tubing Unit equipment, such as BOPs, riser and flow tee with kill and choke line. There are two valves on the choke line, one manually operated and hydraulically operated. According to API, where should the manual valve be located.

a) Inside
b) Outside

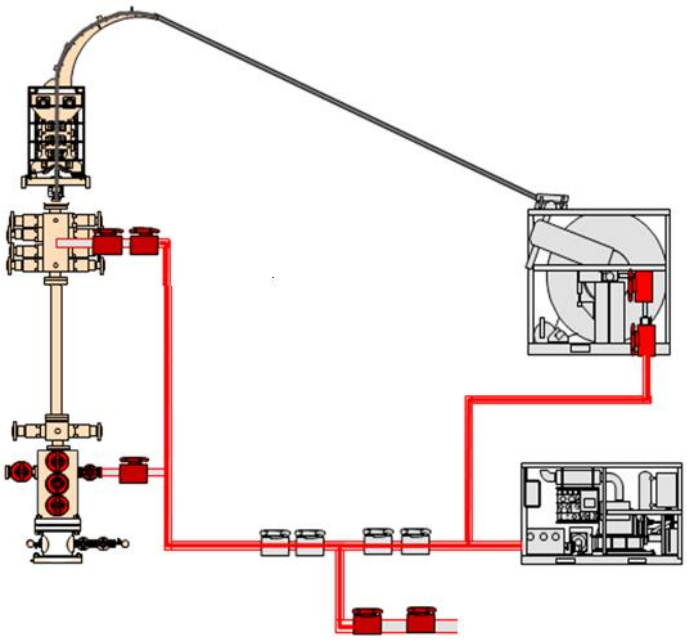
8. We want to pump a ball down the coil to disconnect the Bottom Hole Assembly [BHA] at the BOSS [Ball Operated Separation Sub]. What kind of equipment is used to insert this ball?

a) We do not drop a ball. Instead we use a ball carrier, which is fitted as part of the Bottom Hole Assembly before running the coil in the well
b) End of coil is disconnected from the low-torque valve situated at the centre of the reel and then the ball is dropped inside the coil before reconnecting the low-torque valve
c) A ball-injector is used, commonly rigged up between the reel swivel and the coil on the reel
d) Disconnecting the coil from the BHA is not possible by using a ball. It will not pass the check valves. Instead we use a hydraulic or tension disconnect.

9. We are using a Side Door Stripper and the Stripper Rubber is hydraulically energized. If the well pressure increases over time, will this also increase assist in energizing and sealing the Stripper Rubber on the coil?

a) Yes
b) No

10. Coiled Tubing has been rigged up on a live well. There are lines from the pump connected to the Kill Wing of the Xmas Tree, to the Quad BOP and also to the Reel?



A. The Blind Rams and Safety Head [Shear/Seal] are to be tested from the correct direction and without Coiled Tubing across the Quad BOP. Through which connection should test pressure be applied?

A1) Coiled Tubing Reel

A2) Quad BOP Kill Port

A3) Kill Wing on the Xmas Tree

B. When pressure testing the Pipe Rams, how would this be done?

B1) By pumping through the Kill Wing connection

B2) By pumping through the coil

B3) From below, with a straight bar across the Pipe Rams

B4) From below by pumping through the Quad BOP Kill Port

C. When pressure testing the Coiled Tubing Check Valves, how would this be done?

C1) Pump through the coil and pressure up against the Stripper or Pipe Ram. Bleed back the pressure in the coil within its collapse limit, and check for pressure increase in the coil

C2) Pump into the Quad BOP up to the rated BOP pressure gainst the Stripper or Pipe Rams with the coil open, and check for flow back from the coil

C3) Pump into the Kill Wing against the Stripper or Pipe Rams with the coil open and check for back flow from the coil

11. The Coiled Tubing is used for a sand clean-out on a live well. Returns are taken through the choke line and onwards to the separator. To which upstream and downstream connections should the adjustable choke be routed?
TWO ANSWERS

a) The inlet to the reel
b) The inlet to the separator
c) The coil/completion annulus exit
d) The completion/casing annulus exit

12. Which of the following would normally be closed to seal in order to change a worn Stripper Rubber with the Coiled Tubing still in the well and a Quad BOP in use?
TWO ANSWERS

a) Slip Rams
b) Pipe Rams
c) Blind Rams
d) Shear or Cutter Rams
e) Shear/Seal BOP [Safety Head]

13. When rigging up Coiled Tubing on a well, which of the following statements are correct?
TWO ANSWERS

a) A quick union that is made up hand tight only may cause a leak
b) A damaged ring joint gasket may cause a leak
c) A damaged 'O' ring or seal surface may cause a leak
d) BOP locking stems not screwed in fully may cause the BOP Rams to leak

14. A ball has been dropped to open a circulating sub that is located just above the check valves. Reverse circulation can now be performed. If the well remains live, which of the following statements are correct?

a) While pulling out, the valve on the coiled tubing reel has to be closed to ensure we maintain proper internal well control
b) The coil can be pulled out in a normal manner after the check valves have been tested successfully
c) There will be no mechanical barriers at the bottom of the coil while pulling out
d) To maintain proper well control, reverse circulation must be continued while pulling out

15. Of the three common types of stripper, which has the packing replaced through the top of the stripper?

a) Conventional Stripper
b) Side Door Stripper
c) Radial Stripper

16. The Coiled Tubing has ruptured somewhere above the gooseneck and it appears that the Check Valves are not holding. Which of the following would be the most appropriate action?

a) Kill the well by bullheading down the CT Annulus
b) Contact Operator's Representative and request for approval to close the BOPs
c) Observe the flow and evacuate all personnel from the worksite
d) Shear the Coiled Tubing and then seal open hole

17. What is the first action to take after connecting the BOP hydraulic hoses in preparation of BOP pressure testing?

a) Function test the BOPs
b) Install the Injector Head
c) Open up the Xmas Tree Valves
d) Sign the handover document from production

18. What is the main reason for including an Annular Preventer in the rig up of a Coiled Tubing Unit?

a) It is mandatory on high pressure wells
b) It permits closure around large diameter BHA items
c) It is the only way to strip Coiled Tubing into the well
d) It serves as a back-up in case of Stripper Rubber failure

19. What are the main advantages of a Combi BOP over that of a Quad BOP?
TWO ANSWERS

a) A Combi BOP is shorter and requires less height between Xmas Tree and Injector Head
b) After cutting the Coiled Tubing, it will be much easier to pump kill fluid with a Combi BOP than with a Quad BOP
c) There are fewer steps to take in case of emergency when using a Combi BOP
d) After cutting the Coiled Tubing, it will be possible to pump down the annulus when using a Combi BOP and not with a Quad BOP
e) There will be less shearing force required when using a Combi BOP than when using a Quad BOP

20. When using a Stripper, which of the following statements is a good definition of 'Well Pressure Assist'?

a) The well pressure acting on the piston will produce an additional pressure in the closing chamber and therefore an additional closing force
b) The well pressure acting on the piston must be subtracted from the operating pressure in the closing chamber, resulting in a reduced force
c) The well pressure acting on the lower surface of the piston adds additional closing force to that of the hydraulic pack-off pressure

21. What is the main reason for having a 'weep hole' on a Ram Type BOP?

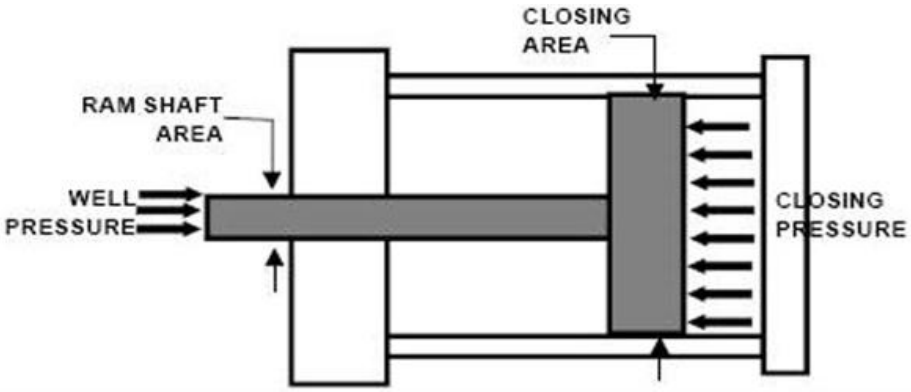
a) To indicate that the Ram Body Seals are leaking
b) To indicate that the primary Ram Shaft Seals are leaking wellbore fluid or hydraulic operating fluid
c) To indicate that the bonnet seals are leaking
d) To indicate that pressure equalization above and below the BOP Rams has taken place and that the BOP Rams can be opened up

22. The Coiled Tubing is being used for a sand clean-out activity. We apply the reverse circulation method. Which of the following statements are true about reverse circulation?
TWO ANSWERS

a) Reverse circulation is only applied to prevent stuck coil situations
b) Reverse circulation cannot be applied when using regular Check Valves
c) Reverse circulation will lower the downhole pressures considerably
d) Reverse circulation will lift solids out of the well better, because the Tubing/CT annulus is usually greater than the CT capacity
e) Reverse circulation is applied when we have a mud motor in the BHA, because it has a suction effect that is able to clean out the sand very efficiently

23. What is the minimum hydraulic closing pressure required to close a ram with a 'closing ratio' of 9.80 : 1 and a wellbore pressure of 8,000 psi?

Answer:_____psi



24. Of the 3 types of Strippers we commonly use, which Stripper requires the Stripper Rubber to be replaced from the top of the Stripper?

a) Conventional Stripper
b) Side Door Stripper
c) Radial Stripper

25. What should be the first action to take if the Stripper starts to leak?

a) Close the Slip Rams
b) Close the Pipe Rams
c) Increase the hydraulic pressure on the Stripper Rubber
d) Continue with the operation, but notify the Operator's Representative

26. Which of the following statements is true when we talk about Ram Type BOPs?

a) It only seals pressure from below
b) It only seals pressure from above
c) It seals pressure from both directions

27. To what pressure is a 10,000 psi Coiled Tubing BOP body tested by the manufacturer before it can be put to use?

a) 10,000 psi
b) 15,000 psi
c) 20,000 psi
d) 5,000 psi

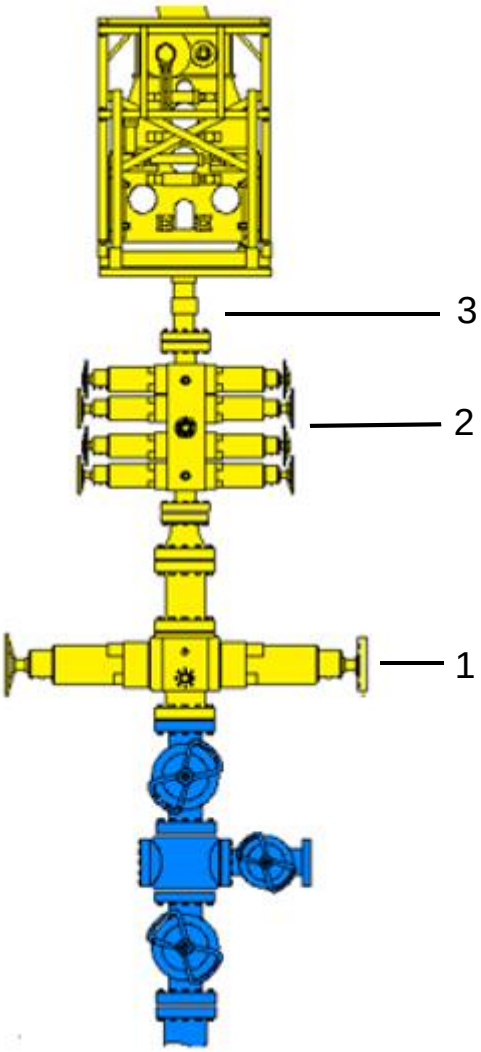
28. Why do we install check valves to the bottom of the Coiled Tubing string?

a) In order to prevent the Coiled Tubing from collapsing when exposed to differential pressures
b) In order to maintain pressure control if the Coiled Tubing starts to leak at surface
c) In order to ensure that the BHA is not exposed to pressure
d) To facilitate testing of the Quad BOP Pipe Rams

29. What is the correct order of BHA elements from bottom of Coiled Tubing string downwards to the Mill or Bit?

a) Connector, Check Valve 1, Release Joint, Check Valve 2, Circulation Sub, MudMotor, Mill or Bit
b) Connector, Release Joint, Check Valve 1, Check Valve 2, Circulation Sub, MudMotor, Mill or Bit
c) Connector, Release Joint, Circulation Sub, Check Valve 1, Check Valve 2, MudMotor, Mill or Bit
d) Connector, Check Valve 1, Check Valve 2, Release Joint, Circulation Sub, MudMotor, Mill or Bit

30. Below is a schematic of a Coiled Tubing Stack rig-up. Match the correct number with barrier shown in the schematic.

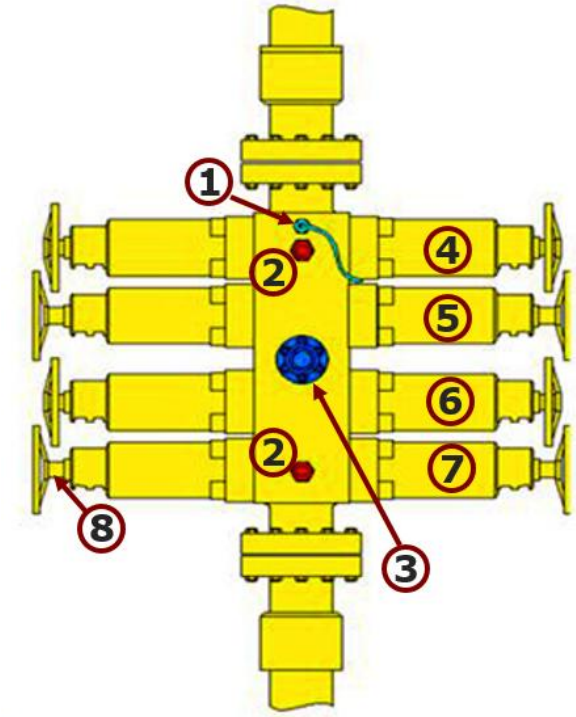


a) Primary Barrier: _____

b) Secondary Barrier: _____

c) Tertiary Barrier: _____

31. Below is a schematic of a Quad BOP. Match the correct number with text on the right of the schematic.



a) Shear Rams: _____

b) Slip Rams: _____

c) Pressure Sensor Port: _____

d) Blind Rams: _____

e) Equalizing Port/Valve: _____

f) Pipe Rams: _____

g) Ram Lock Stem: _____

h) Kill Port: _____

32. In Coiled Tubing BHAs, what is the main advantage of Flapper Type Check Valves over that of Ball & Seat Type Check Valves?

a) Flapper Type Check Valves close much faster
b) Flapper Type Check Valves require less maintenance
c) Flapper Type Check Valves have a higher pressure rating
d) Flapper Type Check Valves permit balls to be pumped through

33. What are the most important reasons for using Coiled Tubing BOPs?
TWO ANSWERS

a) To operate in safe manner and maintain well control
b) To facilitate safe repair of everything that fails above the CT BOPs
c) To supply a greater degree of protection compared to only Strippers
d) To comply with the minimum requirements of API standards

34. A Tandem Stripper is rigged up on Coiled Tubing well control equipment. While running Coiled Tubing in the hole, the Upper Stripper starts leaking, What should you do?

a) Close Shear/Blind Rams, replace worn out Upper Stripper Rubber
b) Close Lower Stripper, replace worn out Upper Stripper Rubber
c) Close Lower Stripper, close Pipe Rams and inflow test, then replace Upper Stripper Rubber and pressure test
d) Pull out to surface, and then replace the worn-out Upper Stripper Rubber

35. You rigged up a Tandem Stripper on Coiled Tubing well control equipment. You close the Lower Stripper and Pipe Rams to change out the leaking Upper Stripper Rubber. How do you know if the Pipe Rams would hold pressure?

a) Well fluid would run out from vent line between Lower Stripper and Pipe Rams
b) Pressure increase at Lower Stripper above the Pipe Rams
c) One can never tell if the Pipe Rams are leaking or not
d) Pressure test the Pipe Rams from above using the Kill Port

36. You have a pump-off sub at the end of the coiled tubing BHA. What do you need in order to release this pump-off sub?

a) Pull approx. 10,000 plbs over free CT weight
b) Bleed off coiled tubing pressure before dropping the ball
c) Pump down the annulus and pressure up
d) Pump down the ball and pressure up

37. You want to rig up a flow tee on Coiled Tubing pressure control equipment. Where should you position the Shear/Seal BOP related to the flow tee?

a) Shear/Seal BOP below the flow tee
b) Shear/Seal BOP above the flow tee
c) Shear/Seal BOP position is not important

38. You are planning a Coiled Tubing operation to clean up the well by pumping down the CT. Where should you position the adjustable choke to control bottom hole pressure?

a) At the fluid exit between completion tubing and casing
b) At the fluid exit between coiled tubing and completion
c) At the inlet of the production separator
d) At the fluid inlet of the reel, next to the swivel

39. At the start of the pressure test sequence, all valves in the diagram below are in closed position. Which valve should be opened to pressure test the Stripper?

a) Valve 10
b) Valve 3, 4, 5, 6 and 7
c) Valve 1, 2, 4, 5, 6 and 7
d) Valve 1, 2, 3, 4, 5, 6 and 7