

## Simulator Quiz

- 1) The pump is running at 30 spm. The stroke counter shows 5,800 strokes and the gas influx is going through the choke. To maintain a constant bottom hole pressure, the choke operator should
  - a. Close the choke
  - b. Open the choke
  - c. Do nothing with the choke
  
- 2) The volumetric method of well control should be implemented when there is a gas kick in the well and :
  - a. There is no pipe in the hole
  - b. The bit is plugged
  - c. The pipe is far off bottom
  - d. No power is available to pump
  - e. All of the above
  
- 3) While preparing kill weight mud the gas influx begins to migrate up the hole. What will happen to the gas bubble pressure as it migrates up the annulus if no action is taken ?
  - a. Increase
  - b. Decrease
  - c. Stay the same
  
- 4) What will happen to the bottom hole pressure in Question # 3 ?
  - a. Increase
  - b. Decrease
  - c. Stay the same
  
- 5) What will happen to the casing pressure in Question # 3 ?
  - a. Increase
  - b. Decrease
  - c. Stay the same
  
- 6) What will happen to the drill pipe pressure (No float in the string) in Question # 3 ?
  - a. Increase
  - b. Decrease
  - c. Stay the same
  
- 7) What will happen to the pressure at the casing shoe in Question # 3 ?
  - a. Increase
  - b. Decrease
  - c. Stay the same

- 8) If the volumetric method of well control is implemented (bleed sufficient mud to maintain the casing pressure constant during the bleed step), what would happen to the pressure of the gas bubble ?
- Increase
  - Decrease
  - Stay the same
- 9) What will happen to the casing pressure in Question # 8 ?
- Increase
  - Decrease
  - Stay the same
- 10) What will happen to the pressure at the casing shoe if the bubble is below the shoe in Question # 8 ?
- Increase
  - Decrease
  - Stay the same
- 11) What will happen to the pressure at the casing shoe if the bubble is above the shoe in Question # 8 ?
- Increase
  - Decrease
  - Stay the same
- 12) The volumetric method of well control is used whenever it is not possible to circulate and a gas kick has started to migrate. In the following example, how many barrels of mud should be bled off to reduce the hydrostatic pressure in the well by 100 psi ?
- |                        |               |       |          |
|------------------------|---------------|-------|----------|
| Upper annular capacity | 0.0489 bbl/ft | SIDPP | 575 psi  |
| Pit gain               | 20 bbls       | SICP  | 890 psi  |
| Mud weight             | 15.4 ppg      | TVD   | 9,873 ft |

\_\_\_\_\_ bbls

- 13) A hydraulic delay exists between the time the choke is adjusted to the time the drill pipe pressure reacts. This hydraulic delay is:
- Equal to the speed of sound.
  - About 1 second per 300 meters of travel time.
  - Always equal to 20 seconds.
  - This is a myth, no hydraulic delay actually exists.
- 14) We are planning to circulate a kick with the wait & weight method. The volume of the surface lines on this rig is 20 bbls. Identify the best procedure for dealing with the volume of the surface lines ?
- Re-zero the stroke counter once kill mud reaches the bit.
  - Subtract 20 bbls (adjusted for pump strokes) from the strokes to bit total on the kill sheet.
  - Ignore the 20 bbls and use it as a safety factor.
  - Re-zero the stroke counter when kill mud starts down the drill pipe.

- 15) A gas kick has been taken in a well with a large open hole section. After a short time, the drill pipe becomes plugged – presumably by debris blocking the bit. Drill pipe pressure cannot be read and no pumping is possible down the drill pipe. There is evidence of gas migration taking place.

Which one of the following well control procedures can be applied ?

- a. Driller's Method.
- b. Lubricate and Bleed technique.
- c. Wait and Weight Method.
- d. Volumetric technique

- 16) Problems that occur during a killing operation may affect the parameters you are monitoring at surface (e.g. drillpipe pressure and casing pressure). For each of the following problems, state the immediate effect on each of the above parameters. Assume pump speed is held constant.

For an increase use this symbol: 

For a decrease use this symbol: 

For no change use this symbol: 

Problem	Drillpipe pressure	Casing Pressure	Bottomhole Pressure
a. Choke washout			
b. Hole in string			
c. Nozzle blowout			
d. Choke plugging			
e. Nozzle plugging			

- 17) During the well kill operation, slowly but regularly you have reduced choke size because the drill pipe and casing pressures keep dropping with constant pump speed. What is a likely cause of this ?

- a. A bit nozzle is washing out
- b. The choke is washing out
- c. You have a washed out pump swab

- 18) Which of the following parameters can be affected by a string washout during a well kill operation ? **(Pick two answers)**

- a. Bottom hole pressure.
- b. Kick tolerance.
- c. Formation fracture pressure.
- d. Slow circulating rate pressure.

- 19) The choke has to be gradually closed due to a string washout. What effect does the gradual closing of the choke have on the bottom hole Pressure ?
- Decrease.
  - Increase.
  - Stay the same.
- 20) How is a choke washout recognized ?
- Rapid rise in casing pressure with no change to drill pipe pressure.
  - Increase in drill pipe pressure with no change to casing pressure.
  - Continually having to open the choke to maintain drill pipe and casing pressure.
  - Continually having to close the choke to maintain drill pipe casing pressure.
- 21) A well is being killed using the Drillers Method. During the first circulation the drill pipe pressure is kept constant at 690 psi and the pump speed at 30 spm. Halfway through this first circulation the operator on the choke observes a sudden increase in drill pipe pressure. There is no significant change in choke pressure and the pump speed is still 30 spm.

What could have happened ?

**(Select three answers)**

- A bit nozzle has partly plugged.
  - The choke has partly plugged.
  - The kick is about to enter the choke.
  - A partial blockage in the kelly hose.
  - Pressure has built up in the mud/gas separator.
  - A partial blockage in the drill string has occurred.
- 22) During a well kill operation, using the Driller's method, the choke pressure suddenly increases by 150 psi. Shortly thereafter the operator observes the same pressure increase on the drill pipe pressure gauge.

What is the most likely cause for this pressure increase ?

- A second influx entered the well.
  - A restriction in the kelly hose.
  - A plugged nozzle in the bit.
  - The choke is partly plugged.
  - A wash out in the drill string.
- 23) What would be the correct action to take when the problem in question 22 occurs ?
- Reduce the pump rate and thus reduce both pressures by 150 psi.
  - Open the choke a little until standpipe pressure returns to the pre-calculated value.
  - No action required, as this pressure increase does not affect the bottom hole pressure.
  - Stop the kill operation, remove the restriction in the kelly hose or change over to the spare kelly hose.

- 24) During a kill, while displacing the drill string with kill fluid, a sudden loss in drill pipe pressure was noticed. The driller continued pumping at the same pump rate, while the supervisor adjusted the choke and continued to follow the drill pipe pressure graph as originally planned.

What happened to the bottom hole pressure as a result of this ?

- a. The bottom hole pressure increased then decreased.
  - b. The bottom hole pressure remained unchanged.
  - c. The bottom hole pressure decreased.
  - d. The bottom hole pressure decreased then increased.
  - e. The bottom hole pressure increased with the choke adjustment.
- 25) Of the following, which one would require opening the choke and shutting in the well ?
- a. Bit nozzle plugged.
  - b. Bit nozzle washout.
  - c. Washout in drill string.
  - d. Pump failure.
  - e. Choke plugged.
  - f. Choke washout.
- 26) During a kill operation, the choke operator notices the drill pipe pressure rises sharply while the casing pressure is steady. He reacts by opening the choke to maintain the correct circulating pressure. This situation continues with increasing regularity.

The choke operator notices that during this operation the choke has been adjusted to full open.

What is the likely cause of this problem ?

- a. choke plugging
  - b. choke washout
  - c. pipe washout
  - d. nozzle plugging
- 27) In the above question, what effect has the gradual opening of the choke had on bottom hole pressure ?
- a. It has decreased.
  - b. It has increased.
  - c. It has remained steady.

28) While circulating a kick, the choke operator has been continually closing the choke in order to maintain the correct drill pipe circulating pressure. The mud logger reports that both drill pipe and casing pressure have been increasing. Note: the choke operator's gauges operate from a different sensor than the mud logger. A check of the gauges on the standpipe and choke manifold confirm the mud logger's report.

Which is the most likely explanation:

- a. The choke is washing out.
- b. The choke operator's casing pressure gauge is malfunctioning.
- c. The choke is plugging.
- d. The mud loggers gauge sensors are malfunctioning.

29) Lost circulation during a well control operation is usually detected by:

- a. Monitoring the return flow with the flowshow.
- b. Monitoring the mud volume in the mud tanks.
- c. Monitoring the pump speed indicator.
- d. Monitoring the drill string weight indicator.

30) While circulating out a kick, the mud pump fails. What is the **first** thing to do ?

- a. Shut the well in.
- b. Fix pump as soon as possible.
- c. Change over to No. 2 pump.
- d. Divert the well.

31) During a kill operation, a pump piston (swab) starts to leak. The choke operator knows nothing about the leak and is maintaining the standpipe pressure following the pressure schedule on the kill sheet. What will be the effect on the bottom hole pressure ?

- a. It will stay constant.
- b. It will decrease.
- c. It will increase.

32) While in the process of killing a well, partial loss of returns occurs. What can be done to reduce the pressure at the loss zone ?

- a. Reduce the pump speed thus reducing the annular friction pressure.
- b. Keep the drill pipe pressure as close to the actual pressure that is supposed to be on the drill pipe gauge. No safety factors.
- c. Use the exact mud density required to kill the well. No safety factors.
- d. All of the above.

33) If the drill string washed out during a kill operation, which of the following would remain constant ?

- a. Bottom hole pressure.
- b. Casing pressure.
- c. Slow circulating pressure.
- d. Drill pipe pressure.