Day 2

1. What is the correct meaning of the term “Secondary Well Control”?
   
   A. Preventing flow of formation fluid into the wellbore by maintaining drilling fluid hydrostatic equal to or greater than formation pressure
   B. Preventing the flow of formation fluid into the well by maintaining a sum of drilling fluid hydrostatic and dynamic pressure loss
   C. Preventing the flow of formation fluids into the well by maintaining the dynamic pressure loss in the annulus equal to formation pressure
   D. Preventing flow of formation fluids into the well by using BOP equipment in combination with the hydrostatic pressure of the mud to balance formation pressure (Correct Answer)

2. Company policy states: “...while killing a well you will always attempt to kill the well using a method that minimizes the pressure on the stack and upper casing.” Which method would you choose?
   
   A. Wait and Weight (Correct Answer)
   B. Driller’s
   C. Lubricate and Bleed
   D. Volumetric

3. You are circulating out a gas kick using the Wait & Weight Method. What will happen to BHP in each of the following situations?
   
   A. If drill pipe pressure is held constant while kill mud is being pumped to the bit.
      a. Increase   b. Decrease   c. Stay the same (Correct Answer)
   
   B. If drill pipe pressure is held constant while kill weight mud is pumped up the annulus.
      a. Increase   b. Decrease   c. Stay the same (Correct Answer)
   
   C. If SPM is increased and drill pipe pressure is held constant.
      a. Increase   b. Decrease   c. Stay the same (Correct Answer)
   
   D. If the gas bubble is not allowed to expand.
      a. Increase   b. Decrease   c. Stay the same (Correct Answer)
4. The following diagrams depict approximately the pressure changes at various points in a well being killed using the Wait and Weight Method and maintaining the correct bottom hole pressure. (The diagrams are not to scale)

Match the following names to the correct graphs – write the appropriate number in the answer boxes provided.

1. Drill Pipe Pressure  
2. Bottom Hole Pressure  
3. Casing Shoe Pressure  
4. Surface Casing Pressure
5. When starting a kill operation with a surface BOP, the choke pressure is held constant while bringing the pump up to speed. The drill pipe pressure gauge now reads 250 psi higher than the calculated initial circulating pressure. To maintain constant BHP, what is the best action to take?

A. Open the choke and let the standpipe pressure drop to the calculated initial circulating pressure.
B. **Continue to circulate with the new initial circulating pressure and adjust the drill pipe graph accordingly (Correct Answer)**
C. There will now be a 250 psi overbalance on the bottom which is acceptable. Nothing needs to be done.

6. A well is being killed correctly using a constant BHP method. At what stage during the kill operation can the choke pressure reading exceed the MAASP without breaking down at the shoe?

A. Kill mud circulated to the bit
B. **Influx in the casing annulus (Correct Answer)**
C. Influx around the BHA.
D. Influx in the open hole annulus

7. On the second circulation of the Driller’s Method if the casing pressure was held constant until KWM reached the surface what would happen to BHP?

A. **Increase (Correct Answer)**
B. Decrease
C. Stay the same
8. A well is being killed using the Driller's Method.
   Original SIDPP = 500 psi
   Original SICP = 900 psi

   After the first circulation the well is shut in and pressures allowed to stabilize. They then read:
   SIDPP = 500 psi
   SICP = 650 psi

   It is decided not to spend any more time circulating original mud. Which one of the following actions should be taken first.

   A. Prepare to use the Wait and Weight Method
   B. Bullhead annulus until the SICP is reduced to 500 psi
   C. Reverse circulate until the SICP is reduced to 500 psi
   D. **Continue with the second circulation of the Driller's Method (Correct Answer)**

9. For each of the following statements note whether it relates to the Driller's Method or the Wait and Weight method. Circle the correct method.

   A. Minimizes pressures experienced on surface.
      Driller's  **Wait and Weight (Correct Answer)**

   B. Removes influx from the hole before pumping KWM
      Driller's  Wait and Weight
      **(Correct Answer)**

   C. Pump KWM while circulating the influx up the annulus
      Driller's  **Wait and Weight (Correct Answer)**

   D. Maintain a constant drill pipe pressure for the first circulation
      Driller's  Wait and Weight
      **(Correct Answer)**

10. Under which circumstances would the Wait and Weight Method provide lower equivalent pressure at the casing shoe than the Driller's Method?

    A. When the drill string volume is greater than the open hole annular volume
    **B. When the drill string volume is less than the open hole annular volume (Correct Answer)**
    C. The pressure at the casing shoe will be the same regardless of the method used
11. Which statement is correct when comparing the Driller's Method and the Wait and Weight Method?

A. The Driller's Method will give the lowest casing shoe pressure when the open hole annular volume is larger than the drill string volume
B. The Wait and Weight Method will give the lowest casing shoe pressure when the open hole annular volume is smaller than the drill string volume
C. **The Wait and Weight Method will give the lowest casing shoe pressure when the open hole volume minus the gain is larger than the drill string volume (Correct Answer)**
D. The Wait and Weight Method will always give a lower maximum pressure at the casing shoe than the Driller's Method

12. An influx is being circulated out using the Driller's Method and using 1,100 psi at 30 spm. The operator decreases the pump speed to 25 spm but holds the PUMP PRESSURE constant. Does this have any effect on bottom hole pressure?

A. **Increases BHP (Correct Answer)**
B. Decreases BHP
C. BHP remains approximately the same

\[ \text{Equation \#9 - New PP} = \text{Old PP} \times \left( \frac{\text{New SPM}}{\text{Old SPM}} \right)^2 \]

\[ 1100 \times \left( \frac{25}{30} \right)^2 = 764 \text{ psi} \]

\[ 1100 \text{ psi} - 764 \text{ psi} = 336 \text{ psi} \]

13. An influx is being circulated out using the Driller's Method and using 1,100 psi @ 30 spm. The operator increases the pump rate to 35 spm but holds the pump pressure constant. Does this have any impact on bottom hole pressure?

A. Increases BHP
B. **Decreases BHP (Correct Answer)**
C. BHP remains approximately the same

\[ \text{Equation \#9 - New PP} = \text{Old PP} \times \left( \frac{\text{New SPM}}{\text{Old SPM}} \right)^2 \]

\[ 1100 \times \left( \frac{35}{30} \right)^2 = 1497 \text{ psi} \]

\[ 1100 \text{ psi} - 1497 \text{ psi} = -397 \text{ psi} \]

14. While in the process of killing a well partial loss of return occurs. What can be done to reduce the pressure at the loss zone?

A. Reduce the pump speed thus reducing 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 with no safety factor
C. Used the exact mud density to kill the well with no additional weight as a safety factor
D. **All of the above (Correct Answer)**
15. It is decided to use the volumetric procedure. That is, bleed enough mud to keep the drill pipe pressure constant at 450 psi, (SIDPP = 350 psi plus 100 psi safety margin). What would the pressure in the gas bubble do as the gas rises?

A. Increase  
B. **Decrease (Correct Answer)**  
C. Remain approximately the same

16. What would happen to bottom hole pressure?

A. Increase  
B. Decrease  
C. **Remain approximately the same (Correct Answer)**

17. What would happen to the SICP?

A. **Increase (Correct Answer)**  
B. Decrease  
C. Remain approximately the same

18. What would happen to pressure at the casing seat with the bubble below the casing seat?

A. **Increase (Correct Answer)**  
B. Decrease  
C. Remain approximately the same

19. What would happen to pressure at the casing seat as the bubble is passing the casing seat (some of the influx is in the casing and some is still in the open hole)?

A. Increase  
B. **Decrease (Correct Answer)**  
C. Remain the same

20. What would happen to pressure at the casing seat while the bubble is above the casing seat?

A. Increase  
B. Decrease  
C. **Remain approximately the same (Correct Answer)**
21. Which of the following statements are good operating practices in top hole (surface hole) that have a risk of gas bearing formations. (TWO ANSWERS)

A. Use a high density mud (minimum of 15 ppg) to create a maximum overbalance
B. Pump out of the hole on trips (Correct Answer)
C. Control drill (Correct Answer)
D. Regularly pump a fresh water pill to clean cuttings from the hole
E. Maintain a high rate of penetration to ensure mud viscosity level is as high as possible

22. During top hole drilling from a jack-up rig the well suddenly starts to flow due to a shallow gas kick. What would be the safest actions to take for the rig and personnel? (TWO ANSWERS)

A. Activate the blind/shear rams to shut in the well
B. Activate the diverter system and remove all non-essential personnel from the rig floor and hazardous areas (Correct Answer)
C. Shut in the well and prepare for conventional kill operations immediately
D. Start pumping fluid into the well at the highest possible rate (Correct Answer)
E. First line up the flow to the mud/gas separator, activate the diverter system, and then remove personnel from the rig floor

23. The main purpose of the diverter system is to:

A. Shut in the well
B. Divert shallow gas away from the rig (Correct Answer)
C. To prevent gas from entering the wellbore

24. Kicks taken while drilling shallow formations should be:

A. Closed in with the annular preventer
B. Closed in with the rams
C. Ignored because the pressure is minimal
D. Diverted (Correct Answer)

25. The pressure build up due to the rising of gas which cannot expand could be called the second build up. The first build up occurs in 5 to 10 minutes after the well is closed in and sometimes takes 30 minutes. What causes the first build up?

A. Gas migration
B. Friction losses
C. Permeability (Correct Answer)
D. Type of influx
26. While drilling ahead the well kicks and is shut in. Drill pipe and casing pressures start to rise before stabilization and then both drop quite rapidly. What has probably happened?

A. The drill pipe has parted
B. The BHA has packed off
C. **A formation has broken down (Correct Answer)**
D. The pressure gauges need to be changed

27. While drilling, a gas kick is taken and the well shut in. The driller reported a 17 bbl pit gain.

SIDPP = 525 psi; SICP = 0 psi

The choke was opened and there was no flow from the annulus and the drill pipe pressure remained constant. What is the probable cause?

A. The casing gauge is malfunctioning
B. The drill string has twisted off
C. The well is swabbed in
D. **The hole has packed off around the BHA (Correct Answer)**
E. The formation at the casing shoe has fractured

28. The reason the casing pressure is usually higher than the SIDPP is:

A. The cuttings in the annulus are lighter therefore creating a lighter hydrostatic in the annulus
B. **The influx fluid is usually less dense than the existing mud weight (Correct Answer)**
C. The casing pressure is not necessarily higher, it depends on whether it is an offshore or land operation
D. The only difference is the type of gauges used to measure pressures

29. Which of the following parameters primarily affect the value of the SICP when a well is shut in on a kick. *(THREE ANSWERS)*

A. **Pore pressure (Correct Answer)**
B. Bottom hole temperature
C. **Hole or annulus capacity (Correct Answer)**
D. Drill string capacity
E. **Kick volume (Correct Answer)**
F. Length of the choke line
30. Fast drilling in large diameter holes may cause errors in shut in pressures. If a well is shut in on a kick, just after a period of fast drilling, would you expect the SICP to be:

A. Higher than if drilling had been slow  
**B. Lower than if drilling had been slow (Correct Answer)**  
C. The same whether the annulus was clean or loaded with cuttings

31. When tripping out of a vertical well with a surface BOP stack, the well is shut in after a gas kick has been taken. The bit is 950 feet off bottom and the influx is estimated to fill the bottom 300 feet of the hole. The SICP is 450 psi.

What will the *most likely* SIDPP be?

A. *The same as SICP (Correct Answer)*  
B. Higher than SICP  
C. Lower than SICP because of the ECD  
D. Impossible to say if the exact location of the kick is not known
32. Mud weight increase required to kill a kick should be based upon:

A. **SIDPP (Correct Answer)**
B. SICP
C. OMW plus slow circulating rate pressure
D. SICP minus the SIDPP

Equation #13 – Kill Mud Density ppg = (SIDPP ÷ TVD ft ÷ 0.052) + OMW ppg

33. The correct gauge to use to calculate KWM is:

A. The gauge on the choke and kill manifold
B. The drill pipe pressure gauge on the driller’s console
C. The casing gauge on the driller’s console
D. **The drill pipe pressure gauge on the remote choke panel (Correct Answer)**
E. The casing gauge on the remote choke panel

34. A flowing well is closed in. Which pressure gauge is used to determine formation pressure?

A. BOP manifold gauge
B. **Choke console drill pipe pressure gauge (Correct Answer)**
C. Driller’s console drill pipe pressure gauge
D. Choke console casing pressure gauge

35. A kick has been taken in a horizontal well. Use the following data to calculate the mud weight required to kill this well:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>12.8 ppg</td>
</tr>
<tr>
<td>Length of horizontal section</td>
<td>5990 feet</td>
</tr>
<tr>
<td>TVD at time of kick</td>
<td>5820 feet</td>
</tr>
<tr>
<td>TVD at start of horizontal</td>
<td>5790 feet</td>
</tr>
<tr>
<td>MD at start of horizontal</td>
<td>13,680 feet</td>
</tr>
<tr>
<td>SIDPP</td>
<td>230 psi</td>
</tr>
<tr>
<td>SICP</td>
<td>240 psi</td>
</tr>
</tbody>
</table>

KWM = **13.6** ppg

Equation #13 – Kill Mud Density ppg = (SIDPP ÷ TVD ft ÷ 0.052) + OMW ppg
(230 ÷ 5820 ÷ 0.052) + 12.8 = 13.55 Round up 13.6 ppg
36. A gas kick has been taken in a well with a large open hole section. After a short time the drill pipe becomes plugged by debris blocking the bit. Drill pipe pressure cannot be read and pumping is impossible down the drill pipe. There is evidence of gas migration taking place. Which one of the following control procedures can be applied?

A. Driller's Method
B. Lubricate and Bleed
C. Wait and Weight Method
D. Volumetric method (Correct Answer)

37. A vertical well is shut in on a gas kick. The kill operation is delayed and the influx starts migrating. Both the drill pipe and casing pressures have increased by 100 psi as a result of migration.

**WELL DATA**

<table>
<thead>
<tr>
<th>Well Depth</th>
<th>10,000 feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing shoe depth</td>
<td>6000 feet</td>
</tr>
<tr>
<td>MW</td>
<td>11.7 ppg</td>
</tr>
<tr>
<td>DP/OH capacity</td>
<td>.06 bbl/ft</td>
</tr>
<tr>
<td>DP/Csg capacity</td>
<td>.065 bbl/ft</td>
</tr>
</tbody>
</table>

**KICK DATA**

SIDPP = 800 psi; SICP = 1000 psi; Kick Volume = 30 bbls

Assume only drill pipe is in the well. How many bbls of mud should be bled from the well in order to arrive at the original BHP prior to gas migration?

**0.44** bbl

Equation #4 - Formation Pressure psi = HP in Drill String psi + SIDPP psi

\[
(11.7 \text{ ppg} \times 0.052 \times 10,000) + 800 = 6884 \text{ psi}
\]

Equation #26 – Volume to Bleed off bbls = \[
\frac{\text{Incr in Surf Pressure psi x Influx Volume bbls}}{\text{Formation Pressure psi} - \text{Incr Surf Pressure psi}}
\]

\[
\text{Volume to Bleed off bbls} = \frac{100 \text{ psi} \times 30 \text{ bbls}}{6884 \text{ psi} - 100 \text{ psi}} = 0.44 \text{ bbl}
\]
38. Which of the following best describes the Volumetric Method of well control?

A. Maintains a constant pressure in the influx as the influx migrates up the well
B. **Maintains a constant BHP as the influx migrates up the well (Correct Answer)**
C. Maintains a constant casing pressure as the influx migrates up the well
D. Maintains a constant pressure at the casing shoe as the influx migrates up the well

39. A vertical well is shut in on a gas kick. The kill operation is delayed and the influx starts migrating. Both the drill pipe and casing pressures have increased by 100 psi as a result of migration.

**WELL DATA**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Depth</td>
<td>12,000 feet</td>
</tr>
<tr>
<td>Casing shoe depth</td>
<td>9000 feet</td>
</tr>
<tr>
<td>MW</td>
<td>12.2 ppg</td>
</tr>
<tr>
<td>DP/OH capacity</td>
<td>.065 bbl/ft</td>
</tr>
<tr>
<td>DP/Csg capacity</td>
<td>.070 bbl/ft</td>
</tr>
</tbody>
</table>

**KICK DATA**

SIDPP = 850 psi; SICP = 1100 psi; Kick Volume = 50 bbls

Assume only drill pipe is in the well. How many bbls of mud should be bled from the well in order to arrive at the original BHP prior to gas migration?

**0.59 bbl**

Equation #4 - Formation Pressure psi = HP in Drill String psi + SIDPP psi

\[(12.2 \text{ ppg} \times 0.052 \times 12,000) + 850 = 8463 \text{ psi}\]

Equation #26 – Volume to Bleed off bbls = \[\frac{\text{Incr in Surf Pressure psi} \times \text{Influx Volume bbls}}{\text{Formation Pressure psi} - \text{Incr Surf Pressure psi}}\]

\[\frac{100 \text{ psi} \times 50 \text{ bbls}}{8463 \text{ psi} - 100 \text{ psi}} = 0.59 \text{ bbl}\]

40. The well has been shut in on a swabbed in kick. The SIDPP and SICP both read 350 psi. The bit is 30 stands off bottom. Which of the following would be the safest course of action to take in order to bring the well back under primary well control?

A. Calculate KWM using 350 psi and circulate the well out from that depth using the Wait and Weight Method
B. Bring the well on choke while holding the casing pressure constant as the pump is brought up to the kill rate. Then circulate the influx out using the Driller’s Method
C. **Strip back to bottom using proper stripping techniques then circulate the influx out using the Driller's Method (Correct Answer)**

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*Instructor Solution Answer Key*
41. Which one of the following actions taken while stripping into the hole will help maintain an acceptable bottom hole pressure?
   
   A. Pumping a volume into the well equal to the drill pipe closed end displacement at regular intervals
   B. Bleeding off the drill pipe displacement at regular intervals
   C. Pumping a volume of mud into the well equal to the drill pipe displacement at regular intervals
   D. **Bleeding off the drill pipe closed end displacement of the pipe stripped in at regular intervals (Correct Answer)**

42. When stripping pipe into the hole which valves should be installed?

   A. Full opening safety valve in closed position
   B. Full opening safety valve in open position
   C. **Inside BOP with Full opening safety valve in open position (Correct Answer)**
   D. Inside BOP with Full opening safety valve in closed position
43. A well is closed in on a 30 bbl gas kick while drilling 8 ½” hole at 11,000 feet TVD with 5”, 19.5 lb/ft drill pipe and 750 feet of 6 ½” drill collars.

   Annular Capacities:
   5” DP in 8 ½” Hole .0459 bbl/ft
   6 ½” DC in 8 ½” hole .0292 bbl/ft

   The mud weight is 12.3 ppg and the SIDPP is 350 psi. Assuming a gas gradient of .115 psi/ft. what will the casing gauge read?

   A. 480 psi
   B. 650 psi
   C. 975 psi
   D. 837 psi (Correct Answer)

   Volume of gas around Drill Collars bbls = 0.0292 x 750 = 21.9 bbls
   Volume of gas around Drill Pipe bbls = 30 – 21.9 = 8.1 bbls
   Height of Influx ft = (21.9 ÷ 0.0292) + (8.1 ÷ 0.0459) = 926 ft
   SIDPP psi + [(mud gradient psi/ft – gas gradient psi/ft) x Height of Influx ft]
   = 350 + [(1.6396 - .115) x 926] = 835.7 psi

   Questions 44 through 48 are based on the following information:

   A deviated hole has a MD of 12320 feet and a TVD of 10,492 feet. 9 5/8” casing is set at a measured depth of 9750 feet and 9200 feet TVD. 11.4 ppg mud is in use when the well kicks and is closed in.

   SIDPP
   SICP
   Pit Gain
   Fracture Mud Weight
   DP Capacity
   Casing Capacity
   Slow Circulating Rate Pressure
   750 psi
   1150 psi
   15 bbl
   14.4 ppg
   .01776 bbl/ft
   .0732 bbl/ft
   850 psi

44. The maximum allowable annular surface pressure is rounded off to:
   A. 1370 psi
   B. 1480 psi
   C. 1435 psi (Correct Answer)
   D. 1415 psi

   Equation #12 - MAASP psi = (MAMW ppg – MW ppg) x 0.052 x Casing Shoe TVD ft
   (14.4 – 11.4) x 0.052 x 9200 = 1435 psi

45. The kill weight mud required to balance the formation pressure is:
   A. 13.1 ppg
   B. 12.6 ppg
   C. 12.8 ppg (Correct Answer)
   D. 12.2 ppg

   Equation #13 – Kill Mud Density ppg = (SIDPP psi ÷ 0.052 ÷ TVD ft) + OMW ppg
   (750 ÷ 0.052 ÷ 10,492) + 11.4 = 12.77 ppg = 12.8 ppg
46. What drilling mud weight would give a safety margin of 100 psi after the well was killed?

A. 13.4 ppg  
B. **13.0 ppg (Correct Answer)**  
C. 12.4 ppg  
D. 11.8 ppg

\[ \text{Equation #8 Mud Density} = \left( \text{Safety Margin psi} \div 0.052 \div \text{TVD ft} \right) + \text{Kill Mud Density ppg} \]
\[ = \left( 100 \div 0.052 \div 10,492 \right) + 12.8 = 12.98 = \textbf{13.0 ppg} \]

47. The Initial Circulating Pressure is:

A. 1400 psi  
B. **1600 psi (Correct Answer)**  
C. 1900 psi

\[ \text{Equation #14 – ICP} = \text{Kill Rate Circulating psi} + \text{SIDPP psi} \]
\[ = 850 + 750 = \textbf{1600 psi} \]

48. The Final Circulating Pressure is:

A. 850 psi  
B. **955 psi (Correct Answer)**  
C. 920 psi  
D. 1050 psi

\[ \text{Equation #15 – FCP} = \frac{\text{Kill Mud ppg}}{\text{Original Mud ppg}} \times \text{Kill Rate Circulating psi} \]
\[ = \frac{12.8}{11.4} \times 850 = \textbf{955 psi} \]

49. On a surface stack, what would happen when bringing the pumps up to the kill speed if the casing pressure was allowed to fall below the SICP?

A. Formation would probably break down  
B. **More influx would be let into the wellbore (Correct Answer)**  
C. It would have no affect on anything

50. A kicking well has been shut in. SIDPP = 0 psi and there is a float in the drill string. To establish the SIDPP what action should be taken?

A. **Pump very slowly into the drill pipe with the well shut in. When the drill pipe pressure gauge fluctuates, the float has opened. This pressure is the SIDPP. (Correct Answer)**  
B. Bring the pump up to the kill rate holding the casing pressure constant by opening the choke. The pressure shown when the pump is at the kill rate is the SIDPP.  
C. Pump at the kill rate into the drill string with the well shut in. When casing pressure starts to rise, read the pump pressure. This is the SIDPP.  
D. Shearing the pipe and reading the SIDPP directly off of the casing pressure gauge.
51. Calculate the slow circulating rate pressure. The initial circulating pressure (ICP) is determined by bringing the pump rate to a pre-determined 30 spm by holding the SICP constant. The shut in drill pipe pressure SIDPP is 220psi. At 30 spm the ICP is 1060 psi.

A. 700 psi  
B. 770 psi  
C. 800 psi  
D. **840 psi (Correct Answer)**  

\[
\text{Slow Circulating Rate Pressure} = \text{Initial Circulating Pressure (ICP)} - \text{SIDPP psi} \\
1060 - 220 = \text{840 psi}
\]

52. To find the initial circulating pressure on a surface BOP stack when the slow pump rate circulating pressure is not known and a kick has been taken:

A. Circulate at the desired SPM to circulate out the kick, but hold 200 psi back pressure on the drill pipe side with the choke.  
B. Add 400 psi to the casing pressure and bring the pump up to the selected kill rate while using the choke to maintain an additional 400 psi on the casing.  
C. **Bring the pump up to the kill rate while holding the casing pressure constant at the SICP by choke manipulation. After the hydraulic delay, the pressure shown on the drill pipe gauge is the initial circulating pressure. (Correct Answer)**  
D. Add 1000 psi to the SIDPP and circulate out the kick.

53. While killing the well, as the pump speed is increased, what should happen to the casing pressure in order to keep BHP constant?

A. **Casing pressure should be held steady during a SPM change (Correct Answer)**  
B. Casing pressure should be allowed to rise during a SPM change  
C. Casing pressure should be allowed to fall during a SPM change

54. A saltwater kick is circulated out using the Driller’s Method. The drill string consists of drill collars plus drill pipe and a surface BOP stack is in use. When will the surface casing pressure be at its maximum value?

A. When KWM enters the drill pipe  
B. When the kick has been circulated to the surface  
C. Only when the kick reaches the casing shoe  
D. Just after KWM reaches the bit  
E. **Immediately after the well has been shut in and stabilized (Correct Answer)**
55. The following slow circulating rate pressures (SCRPs) were recorded. Which one does not seem to be correct?

A. 30 spm @ 100 psi
B. 40 spm @ 180 psi
C. **50 spm @ 400 psi (Correct Answer)**

56. A hydraulic delay exists between the time the choke is adjusted to the time the drill pipe pressure reacts. This hydraulic delay is:

A. Equal to the speed of sound
B. **About 1 second per 300 meters (1000 feet) of distance traveled. (Correct Answer)**
C. About equal to 20 seconds
D. This is a myth—no hydraulic delay exists

57. **WELL DATA**

Hole Size = 12 ¾”; DP = 5” OD; DC = 8” X 3” (215 feet);

DC/OH capacity = .0836 bbl/ft; DP/OH capacity = .1215 bbl/ft

While drilling at 12,000 feet a gas kick is taken and the well shut in. The influx volume is measured as 35 bbl. Calculate the length of the influx assuming it is on bottom and does not migrate.

___ 355 ___ feet

*Volume around Drill Collars = 215 x .0836 = 18 bbls*
*Volume around Drill Pipe = 35 bbls – 18 bbls = 17 bbls *
*Height of Influx around Drill Pipe = 17 bbls ÷ .1215 = 140 ft*
*Height of Influx = 215 + 140 = 355 ft*