L-222 725.5

WELL 34/10-4

TEST PROGRAM

WELL 34/10-4. TEST PROGRAM.

The well 34/10-4 Test Program is based on the procedure given in Statoil Well Testing Manual.

Chapter 7, describing the test string running procedure, test intervals, well flowing program, and sampling program has been changed in accordance with this specific well test and are valid for this well only.

Contents.

Attachments:

- Well 34/10-4 Upper Part of the Well Test String Assembly.
- Statoil Well 34/10-4 Halliburton Test String.

Section 7.1. Test Preparations and perforating.

1. The test preparations outlined in Chapter 6 p. in the Well Testing Manual are to be followed (drills etc.)

2. Prior to the running of the test assembly, the following tools/equipment are to be pressured - and function tested.

   - Data Header w/Sand Detector + Sampling Goosneck
   - OTIS Floor Choke Manifold and Halliburton Choke Manifold
   - OTIS Control Head
   - OTIS Lubricator Valve
   - OTIS Sub Sea Test Tree
   - HALLIBURTON Connection immediately above RTTS-packer against APR-valve.

NOTE: Above test pressure: 415 bar (6000 psi)

   - Surface testlinnes and equipment down to Otis burners

   - Otis burners. Function test with water.

3. For plug back : See Plug Back Program.

4. Check weather conditions and forecasts. If good conditions are expected to continue, proceed with casing gun perforating. Turn off all radio transmitters after notifying the Operations Superintendant and other vessels in the area.

5. Rig up Schlumberger, Install the gun with CC-locator.

   a) Gun type: 4" casing gun HJ II, 4 spf.

   b) Perforating interval: See section 7.3. Perforations are to be correlated to the GR/CCL run earlier.

6. Pull perforating gun. Lay down and check gun before turning on radio transmitters. Nipple down Schlumberger.

Section 7.2. Test String assembly and running procedure.

1. Make up the Otis SSTT with fluted hanger and lay down . Make ut the entire tubingstring, pull out and set back in derrick.

NOTE:
- Use API modified RP 5A2 thread compound for the tubing connections.
- Spin the tubing carefully to avoid coupling damage.
- Connections requiring higher torque values than the tubing, (3000 ft-lbs) are to be made up with the backup tong on the crossover, not on the tubing, in order to avoid overtorquing the tubing.

2. Make up OTIS surface control head with one joint of 3½" TDS tubing or pup joint. Lay down same.

3. Make up the test assembly as per attached drawing. Run one pup joint plus perforated tubing below RTTS packer, OTIS XN-nipple, two joints of 2 7/8" EUE tubing and ball plug, (w. drain hole which can be plugged if necessary) A DST hanger shall be located in the coupling between the two tubing joints.

NOTE: All necessary X-overs must be available.

4a. Hang 2 x 550 bar (8000 psi) Amerada pressure recorders w/ 72 hrs clocks on the DST hanger.

4b. Insert 3 x 345 bar (3 x 5000 psi) Lynes pressure and temp. recorders in Otis XN-nipple.

NOTE: Before the recorders are set in the string it must have been clared out that the string will be run and the DST performed immediately afterwards.

5. Precharge the nitrogen chamber in the Halliburton annulus pressure operated test valve to open approximately 70 bar annulus pressure. The valve is kept in open position by allying 100-120 bar (1500-1700 psi) on the annulus. The dump valve (causing the tool to close permanently) should be blanked of.

6. The annulus pressure operated reverse circulating valves should be set to shear and open at approximately 185 bar (2700 psi) annular pressure.

7. RIH with test assembly, having the upper RTTS reverse circulating valve in closed position and fill test string with water.

8. When test assembly including 1 stand 3½" TDS tubing is in the hole, pressure test against the APR-valve with 275 bar (4000 psi).

9. RIH, picking up 3½" TDS tubing. Make up connections to 3000 ft-lbs. Fill string with water as RIH.

10. Space out the test string to locate the RTTS-packer desired distance above the perforations (30 m). Test the string (4000 psi) against APR-valve. Pick up the Sub Sea Test Tree with slick joint and fluted hanger, function test same.

    NOTE: If making up the SSTT with one joint of tubing prior to running in with test string, then do not set the SSTT down into the slips when making up above connection.

11. Pick up above 3,5" TDS tubing.

12. Run OTIS lubricator valve two joints below Control head. Function test and secure hoses.

NOTE: Be careful not to damage the control lines when setting down into the slips.

13. Space out so that the control head is plus/minus 4 m above rotary and land the fluted hanger in the wear bushing.

14. Pull up the string, turn to the right to give 1/2 revolution on the packer and land the fluted hanger in the wear bushing. As the string is lowered, the packer starts taking weight (10000 kg). The lower two slip joints shall be in closed position and the upper two in middle position.

15. Connect chicksans to OTIS control head from the floor test manifold and from the cementing line/Ross Rig choke manifold.

16. Close all valves on the OTIS control head and test chicksans from the cementing unit to 345 bar (5000 psi).

17. Open kill wing valve and pressure test the entire string down to the APR-valve to 345 bar (5000 psi).

18.a Close the sub sea test tree and bleed off pressure above. Check that the SSTT holds the pressure from below.

b Pressure up the string above SSTT and open up SSTT.

Close lubricator valve, and bleed off pressure above. Check that lubricator-valve holds pressure from below. Pressure up the line above lubricator and open this. Bleed off pressure.

19. Close the lower master valve and open fail safe wing valve and pressure test the chicksans down to the Halib. floor choke manifold to 415 bar (6000 psi).

20. Open the floor choke manifold and test line down to heater inlet and bypass valves to max. 345 bar (5000 psi) Bleed off pressure and close floor choke manifold.

20.b Press.test down to sep. inlet 95 bar (1400 psi)

21. Secure OTIS surface control head and latch the tensioning devise onto the string as per attached sketch. Rig up OTIS Stuffing box and wireline BOP above the 5" handling sub.

22. Open lower master valve, close wing valve on kill side (cementing unit), and open fail safe valve on production side, and close floor choke. Close middle pipe ram.

23. Pressure up the annulus slowly to predetermined opening working pressure of the APR valve using one mud pump. The annulus pressure is to be monitored from this step and till well has been killed. Due to the heating of the test string, the annulus pressure may have to be bled off.

NOTE: Excessive annulus pressure will cause the APR reverse circulating valve to shear open. Be aware of an increase in annulus pressure also can be caused by a leak in the test string.

24. When the Halliburton APR-N valve opens, the surface pressure should increase to approximate 121 bar ($\pm$ 1760 psi) indicating that the valve and perforations are open.

25. Flow the well in accordance with the instructions given in section 7.3 for this well and in accordance with the following restrictions/recommendations.

- The well is normally to be closed in at bottom hole (bleeding of annulus pressure) and also at the Halliburton floor choke as soon as closure is indicated. Trapped surface pressure will minimuze the differential over the downhole valve when this is to be reopened.

- The downhole APR-N valve is only to be operated when absolute necessary in order to minimize the chances for failure.

- If the well produces sand in the first test, allowance to shut in well at bottom or at surface must be requested from Statoil Base, due to the possibility that settled out sand may cause plugging of the test string.

Procedure for wireline sampling:

26. Close OTIS lubricator valve and bleed of pressure to 35 bar (500 psi). If the lubricator valve is tight, the pressure should stabilize at approx. 35 bar. Bleed of surface pressure and close Otis choke manifold.

27. Connect 2 Flopetrol samplers and one Lynes pressure recorder to Otis running tool and wire line.

28. Open kill side wing valve to the cementing unit and pressure the lubricator to a pressure 10 bar (150 psi) below the pressure recorded before the lubricator was closed. Close kill side wing valve.

29. Open the Otis lubricator valve, the pressure should increase 10 bar, run the samplers and pressure recorder and take samples.

30. Pull out running tool and samples, close lubricator valve.

31. Open OTIS floor choke and bleed pressure back to approx. 35 bar (500 psi) and check that lubricator valve is holding pressure from below. Bleed off lubricator pressure.

32. Pull out OTIS wire line, close upper master valve. Open the kill side wing valve and repressure the lubricator to a pressure 10 bar below the wellhead pressure recorder before the lubricator was closed.

33. Open the OTIS lubricator valve. The pressure should jump to static wellhead pressure indicating the lubricator valve has opened.

34. If the downhole recorders have to be pulled, the following procedure is to be followed for the wireline operation:

- Bullhead water down the string.

- Close lubricator valve and bleed off pressure to 35 bar (500 psi). If the lubricator valve is tight, the pressure should stabilize at approx. 35 bar. Bleed of surface pressure and close OTIS choke manifold.

- Insert the recorders pulling tool.

- Open kill side wing valve to the cementine unit and pressure the lubricator to a pressure 10 bar (150 psi) below the pressure recorded before the lubricator was closed. Close kill side wing valve.

- Open the OTIS lubricator valve, the pressure should increase 10 bar. Run tool, and latch on to the recorders.

- Pull out recorders and running tool. Close lubricator valve.

- Open floor choke and bleed pressure back to approx. 35 bar (500 psi) and check that lubricator valve is holding pressure from below. Bleed off lubricator.

- Pull out wire line, close upper master valve. Open the kill side wing valve and repressure the lubricator to a pressure below the wellhead pressure recorded before the lubricator was closed.

- Open the OTIS lubricator valve. The pressure should jump to static wellhead pressure indicating the lubricator valve has opened.

7.3. Intervals and test procedures.

Testing program 34/10-4.

Based on logs and available coredata in the zones of interest the following testintervals and -procedures are proposed:

Perforating: 4" casing gun, 4 sh/ft, 90° phasing.

Test string: 3½" tubing w/Halliburton API and RTTS tools.

Recorders: 2 pressure recorders on string.
2 (3) pressure (and temperature) recorders on wireline to be hung in Otis XN-nipple.

Shut-in: All shut-in operations will be bottomhole, (if sand is believed to the present in test string, bottomhole shut-in will be avoided).

Cushion: Full string w/drillwater.

Procedures

DST no. 1 : 1880-1885 (ISF/SONIC)

Objectives : Obtain fluid samples.
Estimation of productivity.
Reservoir pressure and temperature.

Procedures 1 : Initial flow: 2-5 bbls recovered or approx. 5 mins. flow.

2 : Initial shut in: 1 hr.

3 : Second flow: Flow to surface clean up and stabilize flow for surface sampling.

4 : Bottom hole sampling

5 : Third flow: High rate flow.

6 : Build-up. Bottom hole shut in.

7 : End test.

DST no. 2 : 1824-1826 (ISF/SONIC)

Objectives : Obtain fluid samples
Estimation of productivity and sandstrength.
Reservoir pressure and temperature.

1 : Initial flow: As for DST no. 1.

2 : Initial shut in: As for DST no. 1

3 : Second flow: As for DST no. 1

4 : Bottom hole sampling

5 : Third flow: Increase rate in steps until sand is produced at surface. For each step produce the well for at least 30 min. after bottoms up.

6 : Optional bottomhole shut in with build up: If sand is not produced at maximum rate perform a bottom hole shut in.

7 : Fourth flow: If sand is produced to surface during third flow, reduce the rate until sand-free production is obtained.

8 : Build-up. Bottom hole shut in.

9 : End test.

Section 7.4. Killing Well and Plugging Zone.

1. Empty separator contents to burners and flush lines from floor manifold to separator.

2. Pressure kill line to wellhead pressure. Open wing valve on kill side. Open bottom hole APR-N valve by applying annular pressure if this has been closed.

3. Pull downhole recorders according to point 3~~4~~.

4. Bull head down the test string and casing below the packer to the bottom perforation using 1.83 sp.gr. mud. Overdisplace perforations by 1500 litres. Kill mud should provide 25 bar overbalance at the perforation. Pressure up annulus to approximate 190 bar (2700 psi) to open the annulus pressure operated reverse circulating valve. The opening of the reverse circulating valve is accompanied by a drop in annulus pressure. Reverse circulating well till only fresh mud returns.

5. Open middle pipe ram, latch elevator around the handling sub and pick up to release packer. Circulate long way before pulling. Be prepared to direct flow through choke. Pull out test string slowly to avoid swabbing and check for flow.

6. RIH with drill pipe. Try to tag top of any produced sand. Circulate out produced sand if present and tag top of cement plug below the perforations. Record data.

7. Rig up Schlumberger and run gauge ring and squeeze packer on wireline. Set the packer approximately 5 m above top perforation.

8. Pick up stinger, drillpipe and cementing head. RIH and sting into packer. Break down formation and establish a sufficient pump in rate. Mix and bull head class G neat cement. Spot cement on top of packer.

9. Pull out to clear the cement plug. Proceed to next operation.