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Third stage
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Drill Stem Testing, DST

Drill Stem testing provides a method of temporarily completing a well to determine the productivity characteristics of a specific zone. As originally conceived, a Drill Stem Test provided primarily an indication of formation content. Also the pressure versus time chat was available.

Reservoir characteristics that may be estimated from DST analysis include;

- Average effective permeability
- Reservoir pressure
- Identify reservoir fluids
- Well-bore damage
- Barriers, fluid contacts
- Radius of investigation
- Depletion

Tools Used in DST

The type of DST tolls depends on the testing well, whether it is cased or open hole.

a- Surface pressure control equipments

It is a collection of valves, flanges and nipples set on well head, used to control on flow rate and internal closed or flowing pressure.

b- Drill pipe

Drill pipe used as connection between surface equipment and test equipment.

c- Reverse circulation sub

This sub valve used to circulation the drill mud (reveres circulation, from annulus to inside drill pipe), for killing the well and control on well after the test was finish or in emergency cases, and the valve used to empty the drill test stem from fluids when pull out of hole. During the tools run in hole this valve remain closed and still closed until the test was finished, after that its open to control on well.

d- Drill collar

Used to set the packer and open or close tester valve by its weight.

e- Reverser circulation ports

Also, used to reverse circulation of drill mud after the test was complete.

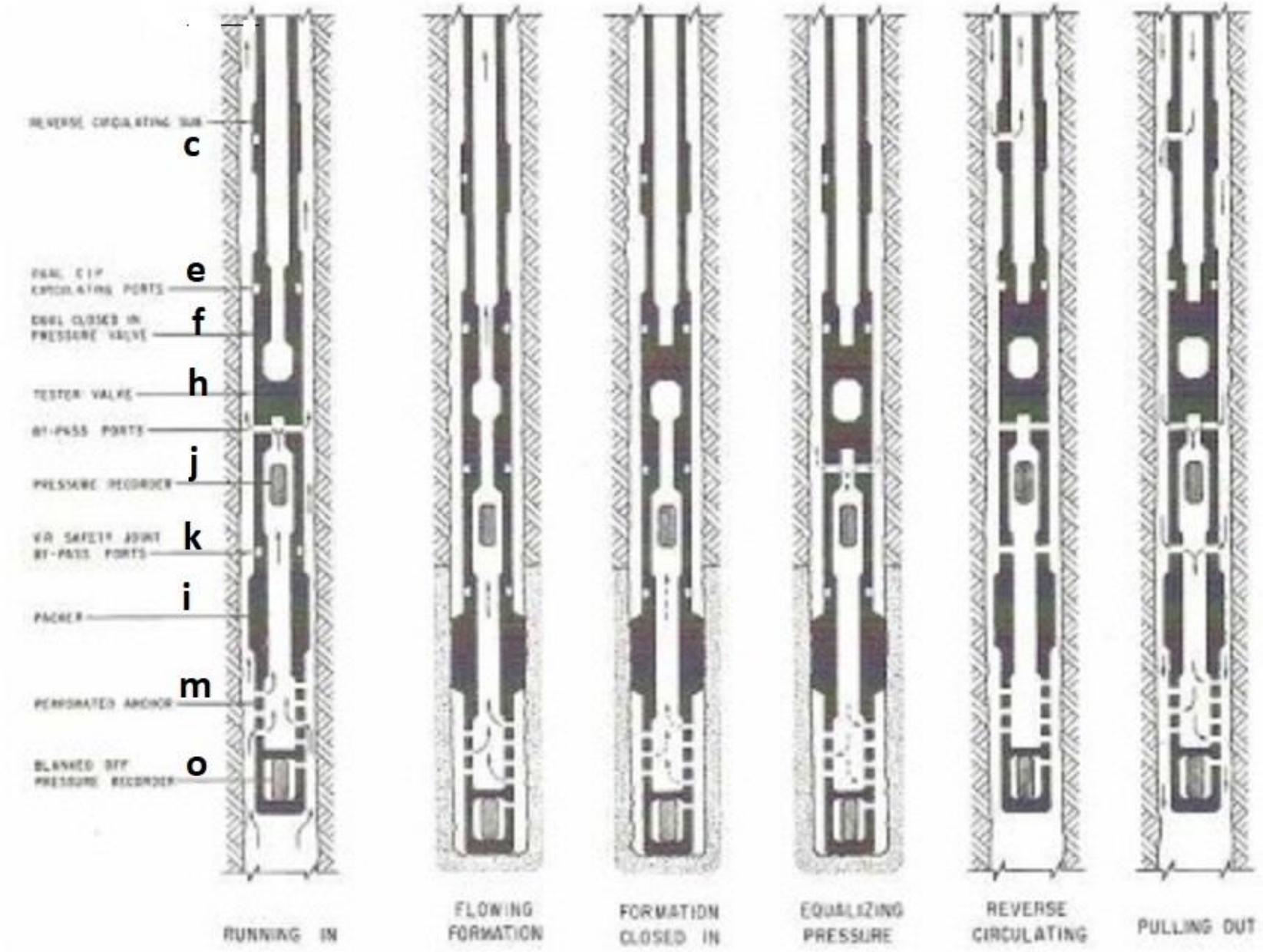

Figure – 25: Fluid passage diagram, open-hole drill stem test.

f- Closed in pressure valve

The valve used to close the drill stem after the test was finish.

g- Flow choke

The flow choke with a specific diameter (5/8 inch) used to fluid flow through it and to calculations purpose.

h- Tester valve

This valve used to control on fluid movement (flow or close), the valve is closed by put the drill stem under tension, or open it by slack off the stem. (Some times the valve called multi flow evaluator MFE).

i- Upper pressure recorder

This instrument includes pressure record that consists from spiral tube that moves according to amount of supply pressure, the tube shifting is transit through a small needle to a black chart (previously, set on it lines with a specific pressure). All operations that occur during the test will recorded on the black chart as pressure versus time profile.

j- Hydraulic jar

It is a motional nipple, used to release the test stem in stuck case.

k- Safety joint

This joint is useful in case of stem stuck. When stem does not release, could back the part of stem by open it from the safety joint.

l- Packer

It is the important part of the test stem; consist from steel and rubber part. After set the packer by supply a certain weight, the rubber part will isolate the upper of well from the formation (remove the hydrostatic pressure from the formation). After the test on formation was completed, then the packer return to its normal situation by removes the supplied weight, and the formation will be under control by the hydrostatic mud column pressure.

m- Perforated pipe

Through this pipe the oil and gas enter inside the test stem.

n- Temperature recorder

This recorder used to record tested formation temperature.

o- Bottom pressure recorder

Its second pressure instrument also used to record flowing and closed bottom-hole pressure.

p- Tail pipe anchor

Tail pipe anchor is the last part of test stem used for support purpose.