



What the eye doesn't see, the heart doesn't grieve over.

Posted by [Heading Out](#) on September 18, 2005 - 12:51am

Topic: [Supply/Production](#)

Tags: [tech talk](#) [[list all tags](#)]

For those not familiar with Saturday Techie Talk this is where I post a little about aspects of drilling and the oil business in relatively simplistic terms so that when we chat about these things, we are all, as it were, singing from the same song book. You are asked to remember that these are very simplistic descriptions and that the suite of previous posts is given at the end of the post.

At the end of last week we were discussing how nice it would be to share our new wealth with our friends, by suggesting that they invest in drilling a step-out well maybe some quarter-of -a-mile away from our well, so that they don't interfere with our production.

But there are places where this is not an easy option. One such, of course, is the current spate of discoveries and development in Deep Water. But one of the earlier places where this came about was in Western Siberia. After all, here you are, finally established on a man-made island in the marsh, and producing oil, and to drill the next well you have to drive another road through the swamp, build an island, move the equipment, recreate the drill site, and start drilling.

As Ivan Ivanovich might say, "why don't you be a good Comrade and let me drill from your site?"

And thus we get into **directional drilling** (and the entirely "accidental" occasional happening of "**subsurface trespass**").

Historically wells were drilled, to as great a degree as possible, vertically downwards. There was the occasional meander, and this had to be corrected, after running a borehole survey, to make sure that the drill eventually arrived at the intended target. But in making those corrections, so a technology evolved that allowed wells to be steered at deliberate angles, and then the light dawned, and **deviated** wells could be steered away, at designated angles from the initial well, and out to some additional nearby possible sources.

When directional drilling first was developed, the process occurred in a series of steps. Remember that the wells are usually cased with a steel liner. So the first thing that has to be done is to cut a **window** in that casing. There are several ways to do this, one of the more efficient of which is to use a high-pressure stream of mud from a jet nozzle, that has had a certain amount of sand added to the mud. This **abrasive jet** can eat through the steel and cut out a segment so that the drill bit can reach and attack the rock.

Now we have to make the drill deflect, and the easy way to do this is to slide a wedge into the hole right at the point where the window is. This wedge is known as a **whipstock** and is very carefully aligned and set into the borehole with the inclined side set so that as a new drilling bit slides down the hole it will be **kicked off** into the window, and as it begins to drill it will penetrate the rock in the required direction.

The hole can be started with a smaller bit until the hole is well established (maybe several feet into the new well) and then this **pilot** bit is removed and a full-scale bit put on the bit to allow the drill to continue creating a new hole moving out from, and down from, the new start to reach the new target either by a straight shot, or by drilling over to the vicinity of the new end point, and then kicking back over to the vertical to drill down into the new oil reservoir. The process is not that complicated, and with practice one can then drill a number of different wells out in different directions from that original hole. And from one location, or **platform**, one can then collectively extract the oil from an increasingly large surrounding area of the reservoir.

I said "historically" because when they tried this in Western Siberia they ran into a problem. The quality of Soviet steel was not that good at keeping the bit turning down and through that bend. And so they had to come up with a different approach. And that, is next week's story.

This is a series of highly informal posts that are aimed at giving some background to what goes into drilling and production from oilwells. Earlier posts in the series are:

[the drill](#)

[using mud](#)

[the derrick](#)

[the casing](#)

[pressure control](#)

[completing the well](#)

[flow to the well](#)

[working with carbonates](#)

[spacing your well](#)

As ever, if this is not clear, or if there is disagreement then please feel free to post, and I will try and respond.

Acknowledgement - the idea for this post came from browsing through "*Russian Oil Supply*" by John D. Grace, which is a very informative, well written, and recommended addition to a PO library.

Technorati Tags: [peak oil](#), [oil](#)



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