



Workover Equipment

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When we began this series of [tech talks](#), a drilling rig was anything that punched a hole through the ground, to get at the oil or natural gas underneath. Once a hole is drilled, however, there is often other work that needs to be done on the well, but now the infrastructure that helped when we drilled the well starts to get in the way when we need to do other things. And so the tool will change to what is known as a workover rig. (Though these could be the old rigs left in place on a platform after the production wells are drilled - just to keep life clear).



Truck-mounted workover rig from [Diesel Power Shares](#)

See there you are, having sunk your kid's inheritance into this oilwell, and it just isn't producing the way you were promised. Sure it's making oil, but the supply seems to be dropping faster than it should, or perhaps there is too much sand coming out with the oil, or the could be any one of a variety of reasons.

And suddenly the partnership is talking about hiring an oilwell service company to bring out a workover unit to come out and fix the problem. You might have heard of one of the two of the small companies that carry out this sort of work, the two more prominent are [Halliburton](#) and [Schlumberger](#), although the latter came into the business first as a company that helped log or survey the hole to determine the types of rock that the drill had gone through. (And in true MSM tradition I should admit that I have consulted for both these companies, and that "small" was meant as a joke).

[Work-overs](#) can deal with a wide variety of problems, but they come at the situation from a

different perspective than the original well drilling. To begin with, there is a cased hole that often goes all the way down to the original pay. Further the tools that will be used are not going, in large measure, to be used to drill new segments of holes, but rather to treat the original well, replace parts that have failed, or change the layer of rock that the well is getting the oil from.

Now there is a word of caution here. To work on the well, the first thing that you are likely to do is stop it pumping oil. That is known as shutting the well in or killing the well. Then you bring in the work-over rig, and do what needs to be done. The workover rig leaves, and you start the well producing again. Here is the caution. Because you stopped the well producing for a while, when it restarts, in most cases, and regardless of whether the action or treatment that the company applied really worked, the well will begin by producing more oil than it did just before it was shut in.

Because the oil well owner may have paid quite a bit of money for a treatment, it is sometimes amazing to me how well educated folk will see that immediate gain and believe that a treatment that in other circumstances they would find incredible, has created an improvement in production. Techniques, for example, that promise the ability to drill lateral wells out from the main bore at high rates of speed – without discussion of where the cuttings that were so miraculously removed went to – may, at some time, be the subject of another post. The well behavior has also to be monitored [over a period of time](#) to validate the improvement (`nuff said).

Some of the treatments that need to be carried out are not very complicated. Perhaps when the well was first drilled it was not effectively acidized or perhaps the oil might have precipitated out some of its contents into the drill pipe as it moved from the completion zone up to the surface. Remember that the oil starts out usually more than a mile or two deep in the ground, where the temperatures can be quite hot. Then as it flows up through the pipe the oil can, for example, suddenly enter a section of the pipe that is being cooled by the North Sea that lies all around it and is a great heat sink. Suddenly any dissolved minerals in the oil might reach saturation and then drop below the saturation temperature, and start to crystallize out. (I have seen pipe sections where the hole diameter has been cut by more than half by crystals that grew in from the wall and were more than an inch long.) Paraffin or similar waxes that were in the oil might similarly, for example, have started to clog the pipe, or some of the carbonate and sulphates in the oil might form a precipitate or scale on the pipeline wall as the oil flows upwards.



A casing scraper ([National Oilwell Varco](#))

These deposits can be removed by putting a scraper onto either the drilling rod of the workover unit, or from [a wireline](#) (a wire line) that is run from the surface, generally from a winch. A wireline can be either a [slickline](#) or single strand cable, or a [braided line](#) which has a number of strands and is capable of carrying a higher payload. These lines can be run into the well very quickly (and in smaller cases do not need to have the well killed to be used).

In a slightly more complicated case an electrical control cable or power cable can be added to the wire to power down-hole operations, particularly when packers or plugs are being used. Depending on purpose these might also be fielded using a more conventional drill string, or through coiled tubing, which I am going to talk about in a different post.

[Packers](#) are devices that are lowered into the well to isolate the well zone in which the work is to be carried out. For example, if one were going to seal off the old production zone and move to another one, one might pack off the old zone, first before pumping cement into the sealed-off segment to fill it with cement.

You can imagine that almost every type of repair must be carried out in this fashion. If something goes wrong down hole, then because of the limits of access it is going to take some imagination to deal with the problem, and the oilwell service companies have now provided that for a number of years.

The more simple jobs, such as sealing off a zone that has stopped being productive, or lowering a new perforating system down the well to stimulate production from the layer of rock, to cleaning the screens at the bottom of the well that keep the rock in place, while allowing the oil to flow into the well, are all somewhat obvious once named, though perhaps not so obviously needed until you see the effect of the problem on well production.

The more common other workover uses, for stimulating production, will be in another post. And once again this has been but a short summary of what can go on, just to describe some of the basic ideas. Comments and questions are welcome.



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