Metering for Profits

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REASONS FOR METERING

What

What is metering? To me, and for the purposes of this discussion, metering means the physical measurement of fluids produced from oil or gas wells. These fluids may be oil, water, or gas or the mixture of any two or all three.

Why

Why do we meter? Probably the primary reason for metering of products produced from oil wells is to consumate the sale of the products. In order for a producer to sell this product or for a purchaser to reimburse the producer, each must know the quantities involved in the transaction. Another eason for metering well fluids is that, in most instances, conservation authorities have requested that periodic production checks be instituted to prevent waste of a public resource.

Still another reason for metering is to obtain information as to the productivity of individual wells and leases. This last reason has been the subject of much controversy in recent years and is the one upon which I shall devote much o this discussion.

How

How do we meter? By far the most common device for metering liquids is the familiar stock tank. This device has been used from the beginning of the petroleum industry and is still being used today. Gas volumes, generally speaking, have been metered by the familiar orifice meter.

In recent times there has been some emphasis on automatic metering methods, the most popular being

1. The positive displacement meter
2. The dump tank type meter
3. The weight controlled meter

Each has its merits and limitations and it is not within the scope of this talk to discuss the details.

Where

Where do we meter?The most common place devoted to metering is the tank battery. This site is favorable because it is the most convenient and economical. It is the point at which fluids from each well are commingled prior to transfer of fluids from the producer to the purchaser.

When

When do we meter? Usually we meter fluids prior to sale or disposal. We also meter at frequencies specified by conservation authorities; we meter too when we desire to know the production ratio of a well or group of wells.

Briefly I have discussed the WHAT, WHY, HOW, WHERE and WHEN of metering. Now I would like to impose upon this discussion one big question:

IS METERING PROFITABLE?

First, we have established that it is a necessity to meter fluids if we are to transfer fluids to their eventual consumer, so it makes little difference here whether this phase of metering is profitable or not. The only question here is one of method. That is, which method is the least expensive and results in the least waste. This is the argument now in question concerning lease automatic custody transfer and conventional crude handling facilities.

There have been numerous articles written concerning the merits and limitations of custody transfer. Most of you are by this time familiar with these arguments, so I'll not discuss this. Second, we have established that the conservation bodies make us meter fluids for their information, so that this portion of a production process cannot be eliminated. So, here again the question is one of method rather than should or should we not.

Then we come to the last reason - that of information. Over this, the producer does have some control He isn't forced to meter fluids for an reason beyond those previously specified. Assuming then that the producer's primary purpose is to produce a profit, any metering of fluids beyond that specified should result in a profit or he shouldn't be metering. How then can metering of fluids be profitable?

To be sure, the cost of metering can be found by establishing the time required for the procedure and the equipment involved; but a producer receives no revenue in proportion to the number of times production is metered. He is paid only in proportion to the amount of oil he can sell. It follows then, that unless metering can increase sales there is no profit. The question then follows, can metering increase sales?

Naturally, if a lease or group of wells is producing and selling all that allowed by the conservation or regulatory officials, then there can be no increase in sales. If the production drops below this figure, then there is "room" for increase. How much metering can increase production is a matter of question; that it can increase production to some extent is certain, provided proper action is taken on the information obtained.

As a typical example, suppose we take a group of wells that produce 600 barrels per day - an average of 100 barrels daily. Each day production reports are sent to the office so that it is easy to determine that the lease is producing at the 600 barrel daily rate. Now let us assume that the daily rate drops to 550 barrels daily. This means that we are losing sales for that particular day or days, at the rate at 50 barrels per day. In order to correct for this decline in production we must determine where the fault lies. Quite naturally, if no surface faults are located, then the fault must be subsurface, or in the well.

The next step of action can either be to attempt to locate the well or wells at fault, or begin to pull wells and examine subsurface equipment on a trial and error basis. Obviously, the trial and error basis would be quite expensive, but it would probably be surprising to most people to learn to what extent it is used in the oil production business, even in these enlightened times. The other method of action would be to test each well

to determine which well or wells is at fault.

In order to determine this, a producer must know each well's capacity before he can compare it with the test he is about to make. In order for the comparisons to be accurate, previous information must be up to date and accurate, otherwise comparative figures are of little value. In order to maintain accurate comparative figures it then becomes necessary to run frequent checks on wells while they are producing at maximum or optimum capacity.

The most rational rebuttal to this argument that I have heard expressed is that the producer is not concerned with a decline in daily production because the oil remains in the reservoir to be produced at a later date. This cannot be denied if we ignore the factor of offset or surrounding drainage which is admittedly small in most cases. One question that does cross my mind when an argument such as this is advanced is, "How much decline does cause concern, 5 - 10 - 50 - 500 - 5,000 barrels daily?" At what present capacity is each group of wells producing today?

I doubt very seriously if any producer could answer that question. To be sure, the capacity of the industry as a whole is greater than the demand for the products, but how long will this situation exist? Looking at the situation in this light, each time that a barrel of oil is delayed simply means that the revenue produced by that barrel lies idle and cannot be used to search for additional reserves.

How much profit is to be realized for metering is a big question, and will always be questionable. That a profit can be realized is not subject to much question. So it becomes a question of how much can be invested in metering to realize a profit. Can automatic metering devices be profitable? The natural tendency is to compare present costs with those imposed by automatic metering devices. If the automatic metering devices cannot result in decreased operating costs, they are eliminated with no consideration to the improved productive efficiency which might be effected by their installation.

I sincerely believe that investments in metering devices to improve efficiencies are profitable. In order to prove this or to recommend such investments to management will require a good bit of effort. It will be necessary to examine production tests and production records of the past to determine to some degree the losses that have occurred. After losses have been established, it will be necessary to convince management that some of, not all, these losses can be avoided through improved supervision (metering) and control. Certainly this is a formidable job, but not impossible.

CONCLUSION

There are many other arguments for metering in secondary recovery projects to improve recovery methods, but these arguments would be even more difficult to substantiate than those advanced above. There are arguments for meters to commingle dual zone production and production from multiple royalty accounts into common batteries. These arguments, however, are a matter of comparative investment costs and operating expense and do not affect to any real degree the productive efficiency of a group of wells.

I feel certain that as time passes the metering devices now on the market will be considered a vital link in the control of productive efficiency.

I hope that these arguments will be of some benefit to you and your companies, if for nothing more than to stir the imagination.