Control Of Lifting Costs

By H. L. Bilhartz
Production Profits, Inc.
Dallas, Texas

To control lifting costs, we first must understand what they are. What parts are subject to our control. How much difference does it make to our company if we can reduce the costs that we do control.

'Lifting costs" are defined in numerous ways. First, let us define them in the broadest possible sense. That is, let us assume an established company. This company wants to continue in business, therefore it must always spend money to replenish its reserves. It must explore, must acquire land, and must drill its share of dry holes. Obviously, it must drill its share of producing wells. Such wells then must be operated until they reach a point of non-profitable return. All these factors, including overhead for the overall operation, must be included in the total cost of lifting oil.

Since "finding costs," used in the broadest sense, are a matter of how much management is willing to spend, these items will omitted from further discussion with a generalization that most majors keep plowing back all surpluses beyond nominal earnings.

Lifting costs, as used in further discussion, are therefore a summation of all other costs of operation. The variation in these costs is considerable, limited on the upper side only by the margin of profit a given operator demands in order to continue operation. It therefore, follows that a considerable portion of the potential oil reserve is lost by high lifting costs. This lost reserve, to some extent, is inherent to the problems of an area of operation. For instance, based on present knowledge and conditions, it is more expensive in the Gulf of Mexico than in West Texas. All other factors being equal, this means the reserves to be lost in the Gulf will be greater than in West Texas. To a lesser degree, the same problem of lost reserve lies within the West Texas Area itself. Herein lies the challenge to both the technical and the operational personnel.

To better understand both the problems and the challenge, let us look at lifting costs percent-wise in the breakdowns conventionally used.

Classification of Expenditure	Range Usually Encountered %	A Fair W. Tex. No. %
Direct Lease Operating Cost	20-30	23.0
District Overhead	4-8	4.6
Depreciation of Equipment	11-20	15.9
Intangible Write-offs	10-30	27.6
Engineering	2-4	2.7
Administration	4-8	6.8
Scientific (which includes research, etc.)	1-1/2-2	1.9
Tax (Omitting Income Tax)	15-35	17.5

Considering that the weighed average lifting cost, that is, after royalty oil is deducted for its free ride, is approximately $1.40 to $1.50 per barrel in West Texas, we have some rough "ball park" number we may use

in our respective individual role to control lifting costs.

Which of these items do we, as working individuals, have some part in? Where can we control lifting costs?

Certainly we have definite and immediate bearing on the direcct lease operating costs. Additionally but to a lesser degree as we come down this list, we exert some degree of control on other items which make up lifting costs.

I would like to point out that many of you have far more to do with lifting costs than you, and in many instances your management, generally think you do. For instance, the pumper by his very manner of operation of equipment causes costs to be acquired and accumulated which have a direct bearing on the selection and the depreciation of the equipment he uses. Nevertheless, leaving this for the moment, most of you here exert relatively direct control, to some degree or other, on approximately 30 percent of the total lifting costs. Let us make the simplifying assumption that the only lifting costs over which you exert any control are the lease operating costs. Using our averages, this becomes approximately 33.4c per barrel (that is, $1.45x23 percent). You all know individual wells or leases which exceed this number. It is in these areas where our individual effort will generally produce most immediate and most satisfying dividends. Considering that many leases in some of the older fields have produced in excess of 1,000,000 barrels of oil, we quickly see that even a cent per barrel reduction in lifting costs becomes significant from the standpoint of the cost over which you exercise some degree of control.

What are some of the factors that make this number excessive?

1. The type of production—that is, whether it is primary or secondary—flowing or pumping. All of these, of course, affect the dollars spent per barrel. Here our control is limited, although we do have something to do with it. For instance, by the manner in which we operate a well, we frequently can postpone the installation of artificial lift equipment.

2. The equipment installed on a lease is an important factor. Poorly designed or sized equipment can raise costs such that premature abandonment of reserve results. Frequently we have little to say about the equipment to be installed. Rather, we are given certain equipment and it is our job to see that it is used to the maximum advantage. This last point is the key to its maximum advantage. Realize here, however, that you do have much to do with the creation of expense and obtaining of data on cost experience of various operating problems. These data are relied on by those who are making the equipment selection. If you, through lack of knowledge or lack of appreciation, or lack of application, have caused excessive lifting costs with a given piece of equipment, this experience then influences the selection of other equipment. On the other hand, if you have caused this number to be low, you are thereby exerting an influence favoring the selection of the type of equipment which you have operated in the past. This is an inescapable factor in the selection of equipment, that is, this past field experience.

3. People (The Supervisor, the Engineer, the Field Man).

Strangely enough we find that in the realms of our control of costs, the largest single factor of influence is ourselves. The manner in which we operate, our general knowledge, our attitude, all these contsitute the phase that we can do something about immediately. We do not have to check with others; we do not have to win by recommendation or proof. We have a direct, immediate effect on control of costs here.

The engineer is your technical support. To work together with him is basic. Lack of cooperation or discretion on either side will defeat the purpose of both.

Perhaps the simplest illustration would be that we assume an experimental electrified lease. We will say that this has been worked out by the Engineer on paper and that Management has bought it on a trial basis and that we are operating it. We know nothing about the problem in general except that it appeals to us. We don't have to fool with cranky engines, we don't have to contend with sand being taken into intakes and cutting our engines out, or cold weather which might cause difficult starting problems. The idea appeals to us, yet we know little about it. We really don't realize that momentary electrical demand has anything to do with costs. To save time, to save being out in the cold or the wind or the rain the night before, we have cut off the power at the master switch. We come out the next morning and in one moment throw master switch to turn the entire lease on in one operation. In so doing, we may have run the entire month's electrical bill inordinately high. Electric power rates are often computed on the basis of "demand." That is, the maximum power used for any 15-minute period during a month. Therefore, if, for just one 15-minute period, you turn on all electric motors on a lease, the demand that month will be a maximum; hence, the bill that month will be higher than had you run the motors for an equal period but over a prorated schedule. In one company of which I have some knowledge, this problem was recognized and discussed with the Engineers. They successfully demonstrated to field personnel the influence of demand, and the importance of counter balance, and thus effected a saving of $5,000 in one year's operation of three leases. This saving, incidentally, was the deciding factor in continuing an electrification program that otherwise would have been abandoned.

So you can see that the field man carries the primary, ground level responsibility. He is also the primary source of information. He and he alone, personally observes on-location happenings. A fundamental part of his responsibility is to act as a liaison between the property, the Engineer, and the supervisor. He must make every effort to rule out personal prejudice and, where possible, must minimize reliance on memory. He must organize his observations so that they are factual and supported by concrete data. He is the first man to provide information that is later used to compute costs and diagnose troubles. There is no getting away from the fact that you are this field man. You, and you alone, know these basic facts. You, and you alone, can pass these basic facts on at a time when they are worthwhile, when they can avoid expenditures; otherwise, management must wait until the failure has occurred, until the cost accumulations themselves force their attention on the problem for a solution.

Therefore, you see that by a good job or a poor one, you help or hurt you company. No one can take your place, no one can make an intelligent decision without your contribution. Your attitude controls the part you play, it makes you good or it makes you poor. Frequently, there is the attitude that oil producing techniques are fixed. This is not true. The entire field of oil production is dynamic and it is dependent on many things besides obvious physical factors. It is based on the many things that change the force of these physical factors. For instance, if through proration or limited producing capacity, we must extend the life of physical equipment 30 or 40 years instead of salvaging it after 5 or 10, we must change our attitude concerning equipment and producing problems. We must not say that because somthing was done this way several years ago, it must be done this way today.

It is true that necessity is the "Father of Progress." The changing conditions force us to greater progress in advancing technical tools which can direct us to a more economical way of conducting our business. The development of these tools gave birth to the Production Engineer. The tools you see him use are sometimes difficult to follow. It is a purpose of this school to orient you to many of these tools. You will hear discussed the dynamometer, the sonolog, corrosion coupons, chemical treatment, cathodic protection. There are hundreds of other specialized tools and methods.

No one man can be an expert in all of them—particularly, a producing man who has to go about his business of producing oil. When can he have the opportunity or the time to even read all the articles published on the various subjects, much less undertake time-consuming creative work in their further development? Yet he (Remember, this is you!) is the man who must, in the final analysis, resolve the new ideas to application for more profit. You, and your technical men, are at your best when you work as a team, when you utilize them to their best advantage. Compare the technical staff with a medical clinic. We normally do not try to learn the specialty field of medicine. We consult our general practioner who frequently either refers us to, or he in turn con-

fers with a specialist. We usually are content to take his word for the why of our ailments and the how of remedying them. There is little question about the fact that any good man can become an expert in any given field if he takes the time, devotes the effort any pays the price to do so. Yet I, for one, have no intention of becoming a technical man in medicine. It is equally unwise to spend our company's resources to become experts in a given field unless they choose to have us become an expert in it. Normally, this is not expected of field personnel. True, you need to understand the problems involved, but your responsibility is to see that the technical advanacements are profitable and carried out in your operation.

If there are those, within your company or elsewhere, who have made it their profession to be expert in some field in which you need help, use them. They, in turn, can help you help yourself. Your attitude in receiving the man with the strange tool, and who is asking apparently stupid questions, can frequently be a rung in your ladder of success.

I have dwelt at some length on the fallacy of trying to become, or pretending to be, an expert in the numerous specialized fields of oil production. This does not mean that you should neglect learning everything you can about your business. There is a vast difference between becoming an expert in the technology of a pumping unit and sucker rod design and understand the basic elements of design and operation. It is a full-time job for a working man to simply keep up with and maintain a speaking acquaintance with the better ways of doing things. By your very presence, I assume that you realize the importance of knowledge. In attending a course like this, the reading of trade journals, and in listening to and discussing problems such as we are talking about, you learn when and how to profitably employ the specialists or the specialists' tools to your advantage.

There is nothing more fatal in the effort of controlling lifting costs than not to recognize costly problems. Recognition of a problem is not simple, because, too frequently, the field man looks at many problems as necessary evils about which nothing can be done. Therefore, the recognition of a problem demands initiative.

As an example, let us consider corrosion. If we adopt the attitude that corrosion is simply the wearing out of equipment, a necessary evil that we must live with, that we can do nothing about but replace equipment as it goes out, we are increasing lifting costs. Also, if we adopt the attitude that we must, through our own knowledge and effort, start from scratch, experiment, and go through all the trial and error that people before us have gone through in the Petroleum Industry, we necessarily are increasing our lifting costs because we, also, are making the mistakes which those people before us made. We are treating with materials they have found to be ineffective in certain correlative environments. If we ignore the problem until it is with us, until we have personally experienced the cost, we have not taken adequate advantage of the fact that an Industry history has been accumulated and is available to us, and thereby, we are also increasing our lifting costs. It is rare indeed if we are having an Industry experience no one else has had before. We should be on the alert for abnormality, for symptoms. We should take action early as a result of this recognition of symptoms. We should point them out to the people who must aid us, who must help us make decisions.

I think that, once again, you can see that the field man must provide a recognition of symptoms. He must supply supporting data to diagnose trouble before costs become excessive. The field man must organize his work so that his presentation of observations is factual and supported by limited concrete data which he has available at the time he reports. That these data will be used to anticipate costs which are justification for preventive or remedial work, is obvious. If you recognize a problem, if you seek competent specialized advice, and execute faithfully remedial practices, you are a good man to have around—you are a good man to promote.

Few of your employers expect you to diagnose technical data and to handle, without assistance, highly complicated problems. It is equally true that your employer does not expect the specialist to tell you how to exercise general control over your operations. Only through education, whether in this school, or in the school of experience, can you come to recognize the early symptoms of problems and recognize the true significance of them. Through education, you learn to present symptoms and supporting data. Through education, you know what generalized tools and people are available to seek help from. Through education, you can effectively execute recommended action. The first step in this education process is a recognition on your part that you are the fundamental variable in controlling lifting costs.