A SUGGESTED SYSTEM OF FORMS FOR CONTROLLING
THE FLOW OF MATERIALS AND EQUIPMENT TO
AND FROM THE PRODUCING AREAS OF
A PETROLEUM COMPANY

THESIS

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CHAPTER I

INTRODUCTION

Statement of the Problem

A rather unique situation presents itself in the control of materials in the petroleum industry because of great areas to cover, diversified activities within those areas, and a multiplicity of operating units being served from the depot of supplies. It is the purpose of this paper to look into the particular problems of keeping an adequate system of stores records in the oil business.

The control of materials and stores distributed from the field operating unit is of necessity achieved through the use of various forms or records written as evidence of transactions among the production units being served. The prime motive of using the forms is to facilitate the movement of goods to their destination within the unit served and to provide an accurate record of the materials received, stored, and distributed.

Objectives of the Study

The presentation of a complete review of inventories and stores systems now in use would be prohibitive in that they are so numerous. The detailed analysis of every
system would comprise a study far beyond the scope of this paper. However, the general practices and routines follow certain patterns and are similar enough in an overall view to permit a study of the system of forms for the control of supplies and equipment in the oil field producing areas.

It is the purpose of this study to establish through library research and familiarization with forms now in use in the field, a suggested system of forms for the control of materials in the petroleum industry.

It is the intention of the author that this system of forms might be usable by a typical oil company in the control of activities immediately related to materials. An overall system of business forms for all phases of activities concerned with inventories would be too large a task. There will be no attempt to design such things as control accounts comprised of ledgers and journals in the accounting department. Neither will there be an attempt to formulate a system of forms, in its entirety, for the purchasing department, although the purchase order will be discussed because of its direct relation to the control of materials. The physical features of the purchase order will not be discussed other than to relate the features adopted by the National Association of Purchasing Agents. Other than the purchase order, the
forms discussed will be comprised entirely of forms that are originated within or retained within the materials control section.

Justification of the Problem

*Materials control in general.*—Materials control is one of the major factors in the success of any industry. The cost data needed for control of expenditures, the production control of various units, and the comparison of the expenses of all departments are based on two major expense items: labor and materials. Of the two, materials generally comprise the larger portion of expense.

The importance of adequate material control cannot be stressed too strongly. Material costs average 55% of the total manufacturing costs of the products of all industries. Furthermore, the complexity of manufacturing operations tends to produce losses and waste in material as articles pass through the plant. It is necessary, therefore, that the cost of materials be carefully controlled and accurately stated. Materials control is exercised through periodic reports and records affecting the purchasing, receiving, and issuing of both direct and indirect material. The records must show the quantity and cost of materials ordered, received, stored, and subsequently issued so that the inventory asset accounts may be correctly computed and shown on the balance sheet and the cost of goods manufactured statement. Also, the correctness of the resulting profit-and-loss statements depends upon the correctness of the inventory asset accounts.¹

The ideal system of handling materials in an organization would be to have the delivery date of required materials discussed will be comprised entirely of forms that are originated within or retained within the materials control section.

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amounts and the date of actual use to coincide and thus avoid providing storing facilities. There are some instances where this is accomplished through delivery contracts covering huge pre-ordered quantities and careful planning of production schedules. However, even in large organizations there can never be attained an exact schedule of production needs and delivery dates. The factors of transportation, changes in plans, and other unforeseen events prevent the ideal from occurring.

Forms, the basic tool of materials control.—As a means of facilitating control over inventories, there has evolved a system of forms used to show evidence of movements affecting materials.

Office forms are the basic tools for all clerical work. They assist in the transmitting of information, in recording past transactions, in supplying control data, and in reducing clerical errors. Office forms are the raw materials; records and reports are the end products.  

To further emphasize the importance of forms in the control of business:

It is unfortunate that business concerns have been so slow to grasp the importance of detailed records; an adequate system is still the exception rather than the rule. . . . Unreasonable detail should of course be avoided but an adequate system of plant records and procedures is generally neither too cumbersome nor too costly. As a matter of fact, business managements often spend large sums for special purposes and in other connections, most of

2George R. Terry, Office Management and Control, p. 292.
which would be unnecessary if a satisfactory system of records were in effect. 3

To some extent it is the increased amount of stores and materials handled in the average industrial organization that makes the use of rather complex intra-departmental communications in the form of written records a necessity. To point out the importance of adequate records of materials transactions, Samuel W. Specthrie has said, "An adequate plan of stores control is necessary in any manufacturing business to (1) minimize waste and theft of materials . . . (2) assure a steady supply of each material item. . . ." 4

**Materials control in the petroleum industry.**--The handling of enormous quantities of materials needed for the productive activity of the present-day manufacturing organization, including repair and maintenance supplies, has developed into a major administrative problem. In many plants the materials section is under separate managerial control and on an equal basis with the planning, production, and sales departments. An industry wherein the materials control section usually is a separate department of vital importance to the day-to-day activity


of the business, as well as to its long term success, is the petroleum industry. The enormous quantity of equipment necessary for operation demands exact control because it is one of the primary capital expenditures and comprises a major portion of the assets.

Within the last half century, the petroleum industry has been one of the largest growth industries in the United States. The wild competition, hit-or-miss tactics, and hell-for-leather production habits of the earlier oil corporations have been replaced by more mature and more sound business policies. Various federal and state legislative acts have toned down the less desirable characteristics of the oil field to practical nonexistence. Some of these acts set up the I. C. C., the Railway Commission, and the Fair Trade Laws.

The oil company of today is a progressive organization operating under a chain of command as complex as a governmental organization. The present tax structures and competitive forces demand that the company stay on its toes in order to survive. The companies of the twenties which produced the maximum of oil in a minimum of time are no longer on the business scene. With the exception of those which had the foresight to change with the times, there are none of the drill-it, pump-it-dry,
and hunt-another-hole type of producers left. The regret-
ful waste of an irreplaceable asset dawned upon the most
competent of the companies and the present cooperative
proration of oil resources developed.

The phenomenal growth of the petroleum industry came
about through the careful control of the productive units
in the field and through improved marketing of the ultimate
products of the refining processes. The growth of the oil
companies paralleled the growth of the automotive and
truck industries. To accomplish a cost basis for tax
purposes and for preparation of financial statements,
there evolved in the oil business, along with other larger
businesses, a need for accuracy in materials and equipment
records to be used in managerial control.

The need for close control of investments in equip-
ment during the thirties hastened the growth of cost
accounting and the evolution of the forms and records used
to aid in the accounting procedures. The coming of war in
the early forties and the resulting shortages, along with
the demand for increased production, brought the managerial
control of the industry to full stature.

Materials control has been a problem since the stone
age. Accumulation of inventories has been a trait of
humanity since man first began to accumulate personal
property. The problems presented in the highly diversified
activities of mankind today are basically the same but they call for more specialized methods of storing and distribution. The petroleum industry is an example of the integration of many activities into one organization to meet the needs of humanity as it has advanced in technology, standards of living, social achievement, and more especially, mechanization.

Fixed assets of producing properties, on the average, are represented by about 25 per cent in leasehold costs and 75 per cent in physical properties and development costs. Lack of proper control of these huge investments and uncertain distribution of development charges into their proper channels has created a problem which stands out in comparison with other advancements as a major weak spot in the oil industry. The problem is one for executive consideration, as the proper control of the tangible and intangible costs affects all departments from the field to the administrative.

The importance of materials storing and distribution in the petroleum industry is perhaps best pointed out by the ratio of investment per employee. The ratio for the entire industry is about $18,400 per worker. In the production, transportation, and refining departments the ratio is $43,500 per employee.6

Because of the high degree of mechanization and the investment per worker, the industry is particularly suited to operations by large aggregates of capital, and is highly susceptible to losses through technological changes.7

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5E. L. Wormington, "Organization for Control of Physical Properties," The Oil and Gas Journal, XXXIX (August 22, 1940), 52.
6J. E. Pogue, Economics of the Petroleum Industry, p. 7.
7Ibid., p. 8.
"What the petroleum industry needs more than anything else is a uniform method of accounting for stocks." The potential losses through technological changes, waste, depreciation, and other charges applicable to inventories make the control of them a first consideration in the oil business.

Plan of Attack and Sources of Data
As a means of finding out what is being done in the field of materials control through the use of forms, a representative group of forms were gathered from various sources. For examples of present forms in use, copies of those used by several selected petroleum companies were gathered. These forms provide the basis of information on accepted practices in the oil field. For forms that are in use, but not specifically designed by one company, standard forms available from printing establishments were obtained. Where it was impossible to obtain an example of a certain standard form, those suggested by contemporary authority were used.

Letters were written to eleven oil companies, two printing companies, two office machine manufacturers, one paper company, and one oil field equipment company. The oil companies were selected on the basis of size; only

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8H. G. Humphreys, The Accounts of an Oil Company, p. 6.
those of national or statewide operation were asked to donate forms for this study. The printing establishments were two of the largest in the nation, both of them being prominent in the Southwest. The paper manufacturer was selected because of the national coverage of its sales and the fact that the public relations department prints materials related to forms and systems as a service to customers and prospects. The oil field equipment company is in reality a service company specializing in service to drilling operations.

The ratio of return on inquiries was 100 per cent on all companies except the oil companies. There was a 45.5 per cent return from them. Only two companies enclosed procedures manuals for the forms, one was a petroleum company and the other was the equipment service company. However, the similarity of operation of all the organizations made the necessity of such manuals unimportant.

As a means of finding out the accepted practices of improvement in materials control, booklets published by the American Management Association were reviewed carefully. Books and articles published by accountants in the petroleum industry, one of which contained excerpts from Uniform System of Accounts for the Oil Industry as adopted by the American Petroleum Institute, were used.
Authoritative recommendations, rules, and the like from library sources were used as a basis for information needed on materials control in general. This information as applied to forms involved in keeping inventory records and to the design of forms was taken from books and magazine articles in the fields of office management, purchasing, production control, cost accounting, and oil field accounting.

After the assimilation of the forms in use and standard forms available from printing companies, the practices were evaluated on the basis of suggestions of the authorities. Portions of each have been combined in an attempt to design a model system of forms for materials control. This model system conforms to the general requirements of size, ruling, information, and other features as suggested by the authorities mentioned in the paragraphs above.

The validation of the model system is dependent upon authoritative opinion for the most part. First hand information from men employed in the field was gathered in several interviews, but their approval of the system designed and presented here has not been sought.

Order of Presentation of the Study

The body of the study consists of four chapters. Chapter II will be concerned with the element of control
as obtained through forms, the planning of a forms system, and the analysis and design of effective forms. Forms are considered generally, rather than specifically, as to their use, control, analysis, and design.

Chapter III will pertain to specific forms utilized in the petroleum industry for controlling activities related to inventories of materials. The forms are presented in a chronological order according to the manner in which they would normally originate in the industry.

Chapter IV will enlarge upon the peculiarities of the petroleum industry pertaining to the general procedures of forms and control as discussed in Chapters II and III.

Chapter V will be comprised of several phases of designing and analyzing a forms system. The forms will be considered as a group of general business forms rather than a set of specific forms.

Chapter VI, the conclusion, will contain a suggested system of forms for use in an oil company, with the criteria developed in the earlier chapters serving as a basis for the system.

Summary

Chapter I presents the problem of controlling materials inventories in the petroleum industry through the use of business forms.

The objective of the study is to establish a system of forms capable of being adapted to the solution of the
problem. As justification of the problem, the importance of materials control in general, the necessity of forms to that control, and the place of forms in materials control in the petroleum industry were considered.

A compilation of forms used in several oil companies was made and the practices of those companies studied to find present day procedures. For an understanding of the general use of forms in business, a review was made of texts and articles written in various fields of business.

The order of presentation of the study was devised as a chronological sequence of the various elements affecting materials control.
CHAPTER II

STORES CONTROL THROUGH FORMS

As a means of establishing criteria for the forms to be formulated from this study, Chapter II will present an analysis of the following: relation of forms and control, maximum and minimum inventories, classification of stores, types of records used in stores control, and stores control in the oil business. The rather detailed analysis of these various items is considered a necessary background to the final solution of the problem. The authoritative opinion as expressed in this chapter will be followed closely in the design of the model form system in Chapter V.

Forms and Control

The failure to provide for adequate stores control is a weak spot in many industries. Lack of supervision of materials often leads to theft or waste of valuable items. "The remedy for such conditions is a simple yet adequate system of materials control."1 It is well and good to trust the judgment and honesty of personnel but the task of keeping them aware of their responsibilities

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should not be overlooked. A gentle yet effective reminder of responsibility is the required use of forms.

A lackadaisical attitude on the part of workers will develop if there is no insistence that they fill in the forms required properly. This condition is particularly likely to happen where the value of the stores is small. Regardless of the value of the inventories, there should be some system of accounting for them. The storekeeper should be held responsible for undue losses, above-average waste, and the higher-than-normal variance from estimated cost.

"In whatever form the stores department is conducted, there will be records that must be kept; these must cover a perpetual inventory and report of things received and all things issued." It is absolutely necessary to have a system of records in order to maintain a shipshape materials section in the modern plant. Written information is needed by management on which to base future plans and on which to evaluate past performances. The operator must maintain written accounts of all incoming, on-hand, and out-going materials. There are seven main purposes of records as given by G. R. Terry, and they are listed as follows:

1. To provide facts
2. To orientate management

3. To make comparisons
4. To detect wastes and errors
5. To standardize written accounts
6. To comply with legal requirements
7. To serve as a basis for policy formation

Stores control, while being important, seldom enjoys the distinction of being treated with the respect that that importance deserves. The average worker knows that the materials he handles daily are expensive, sometimes worth more in dollar value to the company than his services, yet he rarely treats it as he would the same amount of cash.

Capital in the form of money or securities is very carefully guarded. Those in charge must render an accounting for every penny. Capital in the form of materials, equipment, tools, and supplies is rarely so carefully guarded, and in fact is frequently unprotected. Accounting for stores in many cases is most inefficient with little or no idea as to when the stores are used, by whom they are used or for what purpose they are used.

Maximum and minimum inventories.--The control of inventories has been described by Spriegel and others as having two chief functions: first, the limiting of inventories through the setting of reorder points and maximum quantities to order, and second, the function of keeping current reports and records up to date. It is

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3George R. Terry, Office Management and Control, p. 280.
4Cornell, op. cit., p. 313.
the latter function that is of more direct interest in this study because forms afford the information needed to keep departmental records current.

The establishment of maximum and minimum quantities is done to assure amounts of material to meet production needs while keeping the investment in inventories at a minimum. Among the more important factors to be considered in fixing maximum and minimum standards are:

1. Average production requirements and the interval of time between placement or order and delivery
2. Storage space available
3. Working capital available
4. General market conditions
5. Economical quantities to order
6. Possibility of deterioration or obsolescence of materials while in storage
7. Importance of investment involved, including purchase price, cost of purchasing, cost of inventory storage, and inventory carrying charges such as insurance, taxes, rent, depreciation, and interest on investment.

Classification of stores.—A very important aid to the control of materials is the classification and standardization of items within the inventory as set up by the above maximum and minimum quantities. One important value of the classification of materials is that it makes the use of the forms relatively simple and easy. The numbering of parts, lots, units, or other subdivisions makes the requisition and other forms containing descriptive matter pertaining to materials easy to read, uniform in

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content; and it reduces mistakes to a minimum. The part or equipment ordered may be called by several different names in different departments. The classification of materials will eliminate error by assuring that whatever the part is called, it will have the proper identifying number.

The use of symbols to designate items in the inventory reduces clerical time as well as insures proper identification of the items. A form with space allowed for writing out a detailed description of every item on it would be too large for expedient use. The use of a symbol made up of letters and numerals readily identifies a specific item while reducing the reading time necessary for posting or checking the information on the form.

In industrial operation the orderly, organized arrangement of facts and information is a prime essential. In satisfying this requirement an important part is taken by each of three devices: forms, classification, and symbols. They are an integral part of the system or normal routine of operation. A form is a paper layout by means of which information is recorded and transmitted. A classification is a grouping of items having similar characteristics into classes or groups. A symbol is a contracted or shortened expression for an entity or idea. Symbols and classifications greatly facilitate convenience and use of forms.7

The classification of the materials is simplified by the use of symbols. Symbols have the purpose of:

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definitely to indicate the particular item, to the exclusion of all others; and to obtain brevity in writing of orders, reports, documents, etc. The symbol becomes synonymous with the item it identifies. Personnel working with or recording the item will speak and write such things as "1-50-6D" rather than "current assets, outside interest ledger, development costs, derricks."

There are several systems of classification available. The main types are mnemonic, alphabetic, and numeric. The Dewey decimal system with its set delineations and capacity for expansion is an example of a good system. The main things to look for in selecting a system of classification are elasticity, brevity, and mental coordination of the item and its designation. The mnemonic, a combination of the numeric and alphabetic systems, offers the best opportunity for achieving these aims. Alphabetic symbols for departments, combined with numeric listing of activities in that department are possible; for example: "T" for tools, "T-2" for a two inch tool, and "T-2-c" for a two inch crescent wrench. The possibilities of combination of letters and numbers are unlimited.

As an example of the work being done in the classification field, Remington Rand has innovated a new

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Alford and Bangs, op. cit., p. 1338.
department to aid industry in the control of stores.\(^9\) This department has the primary function of reducing the items carried in stock, but a major secondary function has been the reduction of the number of inventory cards and ledger sheets. Such reduction makes possible a smaller labor force and forms inventory.

Started as the Commodity Classification Department during the war, it helped the Navy reduce the parts carried on a submarine from 9,000 to 2,300, a reduction in weight of 2,400 pounds. This reduction was accomplished through the combination of like parts in related equipment, such as radio and radar, into one common classification. The submarine was able to lower the materials storage space from 165 cubic feet to thirty feet.

This was made possible by establishing a standard nomenclature, a sound numbering system, and a classification system. When the material control and classification systems were placed in effect, similar items were grouped together in the stock record or catalog. Duplication of items was eliminated and all items arranged in a logical sequence according to type and characteristic.

*Types of records used in stores control.*—The records used in accounting for materials and supplies purchased and

\(^9\)Author unknown, "For Better Stock Control," *Standardization*, XXI (February, 1950), 29.
received depend upon the accounting system in use, as well as the kind and size of the business. The following illustrates the variety of records that may be kept in an accounting department for recording the purchase of materials and supplies:

1. A simple purchase book or journal
2. Columnar purchase journal
3. Invoice register
4. Voucher register when manufacturing accounts are kept on general books
5. Voucher register when a separate factory ledger is kept for manufacturing accounts
6. Stores ledger cards

The above records are kept by the accounting department as evidence of company transactions. There is, moreover, a specialized group of records from which the foregoing books are posted. These supplementary records are kept by various units in the chain of materials control. The following list from Alford and Bangs presents examples of the forms that might be used. According to these authorities, less than half of the forms are likely to be used in any one plant. The number used would depend upon the system in use and the size of the establishment.

1. Purchase requisition or request
2. Production order requisition
3. Receiving report
4. Inspection report
5. Delivered-to-stores form (incoming purchases)
6. Materials received from manufacturing orders form (parts made in the plant)

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10Lang, op. cit., p. 654.
7. Identification tags (from receiving department)
8. Stores classification (usually a typed, micrographed, or printed record, used as a basis for arranging record sheets and carrying on accounting)
9. Storeroom index
10. Bin tags
11. Stores record card (for storeroom use)
12. Material requisition or stores issue slip
13. Group stores issue form
14. Stores reservation or apportionment sheet
15. Materials transfer form (to switch materials to another job)
16. Combined routing and requisition tag or slip
17. Move order, requisition slip, and production control record
18. Identification tags (for deliveries to manufacturing departments)
19. Stores credit or return slip
20. Stores ledger or record sheet or card (for stores record clerk in production control section)
21. Unclassified stores ledger or record sheet
22. Materials shortage slip, when materials are not on hand.
23. Notice of danger point.
24. Order to stock material—to be used when ordering material for the first time.
25. Verification slip or request for count of stores
26. Stores count report
27. Inventory tag
28. Inventory sheet

As an example of the use of certain of the more common of these forms, the flow chart of forms to and from the stores department in a small factory is presented in Figure 1, page 23. This chart shows the administrative use of the forms in controlling stores. The various forms are used as posting media to the records of the several departments and as filed information concerning transactions affecting stores inventories.

\[\textit{Alford and Bangs, op. cit., p. 354.}\]
Fig. 1--Flow of forms to and from stores department, small factory

1. Requisition for materials and supplies
2. Materials requirement for production schedules
3. Purchase requisitions
4. Triplicate purchase order to receiving department
5. Copy of notice of shipment
6. Return triplicate purchase order
7. Notice of receipt of materials ordered
8. Daily manifest of receipts applicable to production schedules
9. Receipt and disbursement of materials and sub-assemblies, and receipt of finished goods from processing department
10. Shipping instructions
11. Materials tickets on job orders, maintenance and repair orders, and issued on other accounts
12. General orders
13. Reports

*Walter Rautenstrauch, Principles of Modern Industrial Organization, p. 163.
As can be readily seen from the preceding paragraphs, the control of materials is of major importance to an industrial enterprise. The objectives of material control are given as follows by C. W. Sargent:

1. Determining the need for materials
2. Establishing the correct liability to creditors
3. Protecting the investment of the company in materials
4. Providing a record of use, and the accounts to be charged.
5. Economic utilization of materials through the comparison of actual quantities used with quantities allowed
6. Furnishing total inventory values for operating statements

"... accurate stores supervision and records are at the heart of any control system; and there is an accounting operation required to measure, interpret, and utilize the results." In order to meet the accounting requirements and those of the other departments, the control system must be correlated with the handling of the materials. The procedures followed in achieving the correlation of activities entails the use of some system such as the following:

1. Forecasting the long-term sales demand for finished products
2. Planning the long-term production program based upon the long-term sales forecast
3. Forecasting the short-term demand for specific products

4. Originating and scheduling procurement orders for finished products and their related parts and raw materials
5. Recording quantitatively and financially all transactions affecting materials

Stores control in the oil business.--Reviewing the importance of forms in the control of supplies from the viewpoint of the oil producer, one finds the situation similar to that of any other organization; however, the unusually large amounts of capital involved in supplies and equipment makes accurate control doubly important. As previously stated in Chapter I, the necessarily costly investments call for a much more diversified field of action and a far more circuituous route for the forms involved in the transactions affecting transfers, shipments, and orders of materials than is to be found in most industries. It is true that there are relatively small operators who do not have the obstacles of space and distance to overcome; but the larger companies, in order to maintain close unification of departments, must use records of various types in their intra-company communications.

A great variety of forms is used in connection with the handling and control of materials. Many of these forms can be obtained as standard forms.

Some operators, Material Men, and Chief Accountants may prefer to design the forms to be used in order that they will conform to their ideas and particular requirements. The main consideration is that the number and design of forms for recording and control of material shall be adequate without becoming burdensome and more expensive in operation than the extent of materials movement warrants.15

The control of stores in the ordinary industry involves a centrally located system confined within a comparatively small area. The control of materials in some of the larger industries is decentralized to the extent that there may be branches of the firm in several localities or several storerooms in one plant.

The control of materials in the petroleum industry has characteristics and problems similar to those of other organizations, but it differs in that the operations not only take place in separate localities but in a multitude of locations within the several areas. Each lease or well must have its own separate cost records beginning with the day the lease is purchased and ending only when the unit is abandoned.

Variable conditions in the production of oil require that each lease and sometimes each well be operated to conform to its particular characteristics and, in order to facilitate oil recovery at a minimum of expense, this necessitates a change in the production principles to conform to the changing conditions of the lease or well. It is well known that

15R. M. Pitcher, Practical Accounting for Oil Producers, p. 231.
the large investments in equipment are of a mobile character and this fact alone creates a difficult accounting problem. The wide enlistment of factors essential to the production of oil, entailing various clearing accounts, increases the complexity of the problem. 16

The fact that the materials are scattered over a large area of operations makes the control of them mandatory. The multitude of kinds of materials needed for the operations in the production of oil makes necessary an inventory far out of proportion to that carried by other types of industries.

Oil companies carry large stocks of materials, supplies and containers in warehouses located here and there over the operating territory. To maintain control of these stocks, so as to hold them at the minimum of volume, and to have such knowledge of their composition that unnecessary purchases may be avoided is a task of considerable importance and responsibility. 17

Meeting the increased demand for petroleum products led to the phenomenal growth of the industry, but meeting the economic demands made upon the industry by its growth necessitates constant improvement and revision of facilities. One of the techniques under constant revision is the control of costs. The control of costs leads to the control of materials and labor used in producing, transporting, refining, and selling petroleum products and by-products.

16 E. L. Wormington, "Organization for Control of Physical Properties," The Oil and Gas Journal, XXXIX (August 22, 1940), 52.

This control of costs is brought about through the use of records to show evidence of factors affecting the costs.

Control through records is the basis of the compilation of production and cost records. Material control refers to the printed forms, the accounting records and entries, and the necessary cost reports affecting material from the time material is ordered until the completed article is placed in the store-room.13

Summary

Chapter II has presented the various phases of stores control, both from a general viewpoint and from the viewpoint of the petroleum industry. As stated in the introductory paragraphs of this chapter, the criteria suggested by authoritative opinion will be followed in formulating the model system of forms in Chapter VI.

13 John J. W. Neuner, Industrial Cost Accounting, p. 84.
CHAPTER III

STORES RECORDS

Records Used in Controlling Stores

Chapter II established criteria for forms to be designed for materials control. Chapter III will now present the forms that are generally used to achieve this control as found in the systems in use by members of the oil industry and as suggested by authors whose texts were consulted. The forms in Chapter VI will be a synthesis of the items appearing on forms presented here, complying with the general rules given in Chapters II and III and fitting the special requirements of the petroleum industry as given in Chapter IV.

The companies whose forms were reviewed for this study were:

1. The Gulf Oil Corporation
2. The Texas Gulf Producing Company
3. Halliburton Oil Well Cementing Company
4. Phillips Petroleum Company
5. Standard Oil Company of Texas
6. Magnolia Petroleum Company
7. Humble Oil Company
8. Moore Business Forms, Inc.
9. Remington Rand, Inc.

10. Burrough's Adding Machine Company

The practices of the companies are supplemented in the discussion of the forms by the opinions expressed by authors of petroleum accounting and other related texts. The forms are presented according to the following schedule.¹

1. Name of the form
2. Purpose of the form
3. Origin of the form
4. Information on the form
5. Disposition of the copies of the form
6. Discussion of the practices of the companies listed on page 1.

As previously noted in the second chapter, there are numerous combinations of forms for the control of materials. It is unlikely that all of the forms will be used in any one system; however, combinations of others fulfill the functions of those not included. For example: The receiving department may not use a Receiving Report as a separate form, but in the place of it a note as to the date of receipt and quantity of goods received will be placed upon an extra copy of the purchase order at the receiving point and returned to Purchasing. Purchasing, after checking the returned copy of the order with

¹This procedure for presenting the forms was taken from that used by the Halliburton Oil Well Cementing Company in their forms manual.
their file copy, will send the copy to Accounting for verification with the invoice and for making out accounts payable vouchers.

Materials Control Forms in the Oil Business.---The forms most commonly used in the petroleum industry in the transactions related to materials are given as follows by R. M. Pitcher. These forms are in accordance with the standards set up by the American Petroleum Institute.

1. Idle Materials Report  
2. Physical Inventory of Producing Property  
3. Warehouse Inventory (all three of these are on same form)  
4. Order on Warehouse  
5. Warehouse Requisition  
6. Material Transfer  
7. Field Transfer  
8. Trucking and Teaming Report  
9. Truck Driver's Report  
10. Pipe Tallies  
11. Report of Material Received

The above-named forms will be used as a basis for the system to be formulated from this study. This list will not be followed to the letter, but the forms will be used as a base point from which to work. This list agrees rather closely with the forms found in the several oil companies studied; therefore, it should facilitate an overall comparison of the systems under study.

One form that is not included in Pitcher's list is the purchase order. The purchase order, while not originating in

2Robert M. Pitcher, Practical Accounting for Oil Producers, p. 231.
the materials control department, is so closely related to the control of materials that to leave it out would weaken the system. All materials are originated with a requisition and obtained through the purchase order. Copies of the purchase order are commonly used in all departments having anything to do with the receiving of materials shipments. It is used to notify the vendor, to verify accounts payable, to make receiving reports and as a posting medium by the materials control section.

The procedures of inventory control begin with the purchasing of materials. The purchasing is based upon the budgets prepared for the purpose of estimating expenditures. The budget for materials is dependent upon the budgets for sales and expected rate of turnover of finished goods inventory. Some of the many things that affect the purchasing budget are cost of orders, variation in prices and charges with size of order, and storing and handling costs.

Buying and receiving procedure varies with the size and nature of the business. The following outline indicates the principal features of representative practice.

1. Requisitioning
2. Ordering
3. Tracing
4. Receiving
5. Adjustments

The forms furnished for this study by the oil companies were found to agree, in general, with the list as presented on

The various phases of the forms will now be analyzed to furnish background material from which to design the model system in Chapter V.

**Records Used in the Petroleum Industry**

**Purchase Requisition.** This form can be called by several names such as: Requisition for Materials, Purchase Requisition, or Material Requisition. The distinction between them is that one may be used to request a purchase and the other two may be used to request an issue. For the purpose of this study the form will be considered one form performing both functions. The name used is the main difference between the forms and therefore a combination is warranted because it reduces the number of forms used.

**Purpose.** To requisition material purchased and to requisition materials from company warehouses.

**Origin.** The requisition is originated in the field or by a clerk in a division or lease warehouse. It is also used by the headquarters warehouse to request purchase of items for stock.

---

Information Included on the Form.

1. Date
2. Name of vendor if requisition purchasing order; otherwise, left blank
3. Store location of vendor if requisitioning purchasing order; otherwise, left blank
4. Warehouse code or expense to be charged
5. Location to receive material
6. Via--type of transportation
7. Quantity
8. Company number
9. Vendor's number or size
10. Description (if partly filled by division warehouse a note to that effect is made on the first and second copies)
11. Transfer number--Material transfer number on which the material is shipped
12. Department number--Code for warehouse making issue
13. Signature of authorized person making request

Disposition of Copies. The form may be of two or three parts. If it is a two part form, the original goes to the material control section where it is checked and then passed on to purchasing. The duplicate remains in the originating office in the permanent files. If it is a three part form, the first two copies are sent to the division warehouse where one is kept and the other routed as if for a two part form. Any or all of the material may be available at the division, in which case it is shipped out to the requisitioner. The third copy of the form is kept at the originating point for filing.

In the event that the materials are not available at the division or section warehouse, the second copy is filed in the divisional files and the original is sent to the main office. The materials section at the main office checks their inventory

5 Halliburton Oil Well Cementing Company, op. cit.
records and if the material is available at headquarters it is shipped out. The materials control section also checks the records of other leases or division warehouses if the material is not available at the headquarters warehouse. The requisition will be routed to such leases or divisions if it is more economical to do so than order the material requested. In case the material is not on hand in company stores, the requisition is sent to purchasing for preparation of a purchase order.

Practice of Companies. The Gulf Company uses two types of requisitions. One is a general purpose form for use in the field, the Material and Hauling Order which is used to originate any type of order for materials or services from the field level. The other form is the Material Requisition, which is used to request materials or supplies from the warehouse stock. The Material Requisition allows for the possible purchase of the materials to fill the order and thus is used as a purchase requisition also. Each form is made out in duplicate.

The Halliburton Company uses three forms, the Warehouse Delivery Ticket, the Material Requisition and the Purchase Requisition. The Delivery Ticket is used to requisition material from stock, to record issue of material from stock, and to record charge of material purchased for shop orders. The ticket is a three part form. The Material Requisition is a three part form whose purpose is to requisition material from a controlled warehouse or to requisition purchase of materials under contract and for any other materials not stocked. The Purchase
Requisition is a two part form used to request and authorize the purchasing department to issue a purchase order for material. It is originated by the material section for supply stock and expense and by other departments in a like manner.

The Texas Gulf Producing Company uses a two part Requisition with which all requests for materials or services are made. One copy is sent to the home office and the other is filed at the originating point.

The Phillips Petroleum Company uses a two part form which is either a purchase requisition or a material requisition. It is called, "Requisition for Material."

Standard of Texas uses a two part form called a Material Requisition which is also a combination purchase requisition and a materials requisition.

Humble uses a three part form for the purchase requisition, and the material requisition. All requisitions are made on it.

Magnolia Petroleum Company uses a two part form called Requisition for Material as authority for the acquisition of materials, and a two part form called the Memo Order for the issue of material.

**Purchase Order.** "The purchase order is the vendor's authority to ship and charge for the goods specified, and is a buyer's commitment to the vendor for the value of the goods ordered."\(^6\) It is a contract immediately upon issuance of it

as an acknowledgement to previous quotations or offers. It becomes a contract upon acceptance or acknowledgement by the vendor if no previous negotiations have been made.

Purpose. The order serves as a formal record of purchase and, in some cases, as a record of material purchased.7

Origin. The order is originated by the purchasing department upon the receipt of a purchase or material requisition, authorization for expenditure, or a warehouse sale order.8

Information Included on Order. The usual items are, as established by the National Association of Purchasing Agents and the National Bureau of Standards:

1. Requisition number
2. Purchase order number
3. Buyer's name and address
4. Vendor's name and address
5. Shipping instructions
6. Conditions of purchase
7. Listing of materials
8. Price of items
9. Signature of buyer9

Receiving. If there were copies of the purchase order sent to the receiving department, then upon receipt of the goods, the following entries probably will be made prior to returning a copy to purchasing and accounting.

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7 Halliburton Oil Well Cementing Company, Procedure for Purchase Order Form (PC) HOWCO 879.

8 L. P. Alford and J. R. Bangs, op. cit., p. 303.

9 For the arrangement of these items on the Standard Purchase Order form, see Figure 2.
National Standard Zone System for Purchase Order and Inquiry Forms

<table>
<thead>
<tr>
<th>ZONE 2</th>
<th>ZONE 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>For name, address, etc. of buyer</td>
<td>For all necessary instructions of buyer and seller, in upper right-hand corner convenient for reference in loose file or binder</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZONE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>For name and address of seller to whom purchase order is to be mailed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZONE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>For shipping instructions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZONE 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>For general conditions of purchase</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZONE 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>For listing of materials ordered</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ZONE 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature of buyer</td>
</tr>
</tbody>
</table>

Fig. 2

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1. Name of department, warehouse, or other location receiving the material
2. The date received
3. The type of transportation
4. Weight
5. Collect or prepaid freight charges
6. Type of packing, returnable containers, etc.
7. Quantity of packages, barrels, etc.
8. Signature of receiving authority

Disposition of Copies. There are numerous ways of using the purchasing order and as many ways of preparing copies. The form can be from four to eleven copies. If there are four copies, two are probably sent to the vendor, who signs and returns one as an acknowledgement. The third copy may be sent to receiving as a notice of order and as a medium for preparing the receiving report.

The disposition of the copies of the purchase order varies from company to company according to the accounting system. However, a generally used order consists of nine copies and the disposition of it is presented as an example of the departments affected by it.

Copy number: 1. Vendor's copy
2. Acknowledgement copy
3. File copy for purchasing department
4. Follow-up copy
5. Accounting department copy
6. Receiving department copy
7. Receiving department copy
8. Inspection department copy
9. Requisitioner's copy

11 Halliburton Oil Well Cementing Company, Procedure for Purchase Order Form, (PC) HOWCO 879.


Halliburton uses a nine part form thus: 1. Vendor's copy; 2. Acknowledgement copy; 3. Purchasing department copy; 4. Receiving department copy; 5. Receiving report, forwarded to Materials records; 6. Receiving report, forwarded to purchasing; 7. Accounting department copy; 8. Purchasing department extra copy; 9. Warehouse copy, forwarded to material control. Those copies that are sent to one department and then forwarded are used as posting media by the department whose hands it passes through.

Phillips Petroleum Company uses an eight part form that is similar to the previous orders. The only difference found was the omission of one copy for an acknowledgement from the vendor.

The Standard Oil Company of Texas' order is a five part form used in the same way as the nine and eleven part orders. The extra copies are unnecessary as their place is taken by supplementary forms and the elimination of extra file copies.

Magnolia Petroleum Company's order form is a four part one that is made up of the vendor's copy, a receiving report,
a materials requisition which is used by headquarters to issue a confirming order, and the district purchasing file copy. This order form is used by district or field purchasing agents to order material from the vendor and to notify the main office of the purchase with the requisition copy of the order.

Humble Oil Company did not furnish a copy of their purchase order.

Texas Gulf Producing Company utilizes a form similar to that used by Magnolia. It is written by the field authority and confirmed by the home office.

Emergency Purchase Order. The emergency order is used for petty cash purchases in field operations when requisitions to the warehouse or purchasing department would consume too much time. They may be used for larger purchases in the event that the emergency warrants it. The emergency purchase order is not used for the purchase of stock for warehouses but for equipment needed for immediate use.

Purpose. The Emergency Order is provided for the convenience of field representatives at some distance from the home base of supply.

Origin. The order is originated at a field office or lease warehouse upon demand for equipment or services that are not readily available for ordinary sources.

Information Included on Order. The date, name of the originator, name of the vendor, items purchased, price, and
signature of authorized person are on the form. Many plants use an emergency order similar in design and size to the Purchase Order.

Disposition of Copies. Some firms use a two part form, others use a three part or four part form. The two part form usually is distributed as follows: First copy to the vendor and second copy retained in the originating office. The two part form is supplemented by the material transfer, copies of which are sent to materials control and accounting. The three part form furnishes one copy to the vendor, one to the local file, and one to accounting and materials control. The four part form allows two copies to the vendor, one of which is attached to his invoice for payment of credit purchases. The other copies are disposed of in the same manner as those for the three part form.

Practice of Companies. Only three of the firms furnished copies of an emergency order. It is assumed that some of the other firms use such a form, but probably do not call it by that name. The three companies are Gulf, Magnolia and Halliburton.

Gulf Oil Corporation uses a seven part form, copies of which are routed as follows: 1. Vendor's copy; 2. Mailed to Purchasing Agent at main office; 3. Mailed to Purchasing Agent at main office; 4. Mailed to district purchasing agent; 5. Mailed to district or division office; 6. Retained at originating point and filed in the proper account file; 7. Retained at originating point and filed numerically.
Magnolia Petroleum Company utilizes a three part form for making local purchases, which are restricted to small amounts unless otherwise authorized by the Purchasing Department. The original and duplicate are given to the vendor, who attaches one copy to his invoice for payment. The triplicate is retained in the originating office.

Halliburton Oil Well Cementing Company makes use of a four part form that is originated in the field by supervisory personnel to purchase materials or service for company business. The first and third copies are passed to the vendor who retains the third copy and attaches the first copy to his invoice. The second copy, after approval, is mailed to accounts payable section at headquarters office. The fourth copy is passed to the applicable field office where it is filed as a permanent record.

**Idle Materials Report.** This report is kept in the material control section office. It is a record of all material and equipment available for use in the various leases. It affords information as to the location of equipment requested at a glance.

**Purpose.** The purpose of the card record of materials not in use is to keep management informed about the conditions of inventories in the several localities of operations.

**Origin.** The card is originated in and kept by the materials control section. A new card is prepared for each piece of equipment purchased for, or removed from, service on the
producing properties. An entry is made on the card whenever any movement of the equipment is made.

**Information on the Card.** The name of the lease or well where the equipment is located, the condition of the equipment, the price paid for it, the depreciation taken, and the date of purchase are items on the card. The condition of the material is designated as new, used, repairable, or junk.

This card is kept in the same manner that an inventory card is kept. The same posting media are used as those for posting to the inventory ledgers in the accounting department. Maintained usually as a separate card record, it is filed according to lease, district, well, or division in chronological order. The information carried on the card in the system suggested by Pitcher is: class of equipment, unit price, condition of equipment, location, from where, receipts, date, removals, date, number, quantity, balance on hand.\(^{13}\)

**Practice of Companies.** No copies of an Idle Material Inventory card were obtained from the companies from whom information was sought for this study. However, it is justifiable to assume that such a record is kept in most companies. Practice often provides for this record to be kept by purchasing or some other department. The assumption that such a record is kept is based on the very nature of the equipment used in the oil business. The large investments in new and used material on leasehold property demands that such be the case.

\(^{13}\)R. M. Pitcher, *op. cit.*, p. 233.
Physical Inventory of Producing Property. This card record is prepared in the same manner as the Idle Materials Report. In fact, they both may be kept on the same card form by writing the word "Idle" on the cards for that file.

Purpose. The inventory of material "is a form for a card record of producing property equipment and material designed to keep the Material Man informed as to the quantity of material and equipment on each producing property without reference to value. A separate card is carried for each class of equipment, and a separate group of cards is carried for each producing property. The groups of cards for each property is filed in a separate division of the record."14

Origin. The record is originated in the accounting department, materials control section.

Information on the card. The same information is entered on this record as on the Idle Material Card.

Disposition of Copies. Only one copy is prepared of each card for the file.

Practice of Companies. All the companies used an inventory record. The majority of them used a card file of the visible index type. Entries are made for orders, on hand, and issues.

Warehouse Inventory. This inventory is maintained by the warehouseman or storeskeeper. It is set up on the same type of card as the two previous inventories and is kept on a perpetual basis. This inventory is subject to the audit of

14Ibid., p. 232.
the material man and should agree with the material control
section records at all times. Entries are made from notices
from the receiving department and from transfers of supplies
out of the warehouse.

The Purpose, Origin, and Disposition of Copies are
identical to those for the two previous cards.

The practices of the oil companies were also identical
to those for the two previous cards; hence, repetition is not
necessary.

**Warehouse Requisition.** This requisition is used by men
in the field to request issue of warehouse stocks for operational
purposes. It is a two part form ordinarily, and serves as a
basis of record for issues by the warehouseman and as a record
of receipts by the originator. Because of the similarity of
this form to the materials requisition already discussed,
further discussion of the form would be superfluous.

**Material Transfer.** The transfer is an important record
to the petroleum industry. It is used wherever there is a
movement of supplies or equipment, whether it is from ware-
house to warehouse, warehouse to lease, lease to lease, well
to well, to junk, or from the field to the warehouse. Any
movement of any sort is recorded upon a transfer. The form

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15 For further information about the transfer see
R. M. Pitcher, *Practical Accounting for Oil Producers*, or
H. G. Humphreys, *the Accounts of an Oil Company*. 
is called by such names as Field Transfer, Foreman's Memorandum, Warehouse Transfer or the like. All of these are used in the same capacity.

**Origin.** The material transfer is originated at any point wherever material is received or issued.

**Purpose.** The material transfer is used to record movement of equipment about the producing properties.

**Disposition of Copies.** The transfer is a four or five part form ordinarily. The first copy is retained at the originating point, the second copy is sent with the material, the third copy is sent to accounting and materials control, and the fourth copy is retained in the book as a permanent file copy. If a fifth copy is prepared it is used as a trucking and hauling report to the main office after delivery of the material.

**Practice of Companies.** The various companies follow the same general routine for handling materials transfers as that outlined above, but the forms used differ in minor ways.

Texas Gulf Producing Company uses one transfer for all field movements of material. It is a three part form.

Halliburton Oil Well Cementing Company uses a six part form to record transfer of stocks. Copy 1 is mailed to the material control section, Copy 2 is mailed to the point of destination, from whence it is sent to materials control upon receipt of the material. Copy 3 is mailed to the destination with copy 2 for the permanent record. Copy 4 is used at the
division warehouse for posting purposes. Copy 5 is forwarded to materials control for a permanent file copy if it concerns issue of materials from the home warehouse, otherwise it is destroyed. Copy 6 is used as a packing list accompanying the material and is retained in the permanent file at the point of destination.

Magnolia Petroleum Company uses two separate forms in recording transfers of material. The Universal Transfer is used when issuing material from stock or upon movement of material from one location or account to another. The Foreman's Memorandum of Material Transferred is used to show evidence of movement of material affecting plant or field accounts.

The remaining companies use forms comparable to those mentioned above and for the same purposes. The only difference is in the number of copies or the name of the form.

**Trucking and Teaming Report.** This form is a supplement to the transfer.

**Purpose.** To list the quantity and length of materials measured in feet and inches, such as pipe, when it is transferred.

**Origin.** Any location storing or shipping pipe uses the pipe tally.

**Information on the form.** The information includes the originating point, destination, number of joints, and length.

**Disposition of Copies.** Two copies of the form are prepared,
ordinarily, three part forms are sometimes used. The two part form consists of one copy to accompany the material and one for the file at the shipping point. The three part form allows the first copy to be mailed to materials control, and the other two are disposed of in the same way as the two part form.

Practice of Companies. Only three companies sent copies of this form. All of them complied with the discussion above. Since it is a fairly standard form as to design and use, no further statement is necessary.

Report of Materials Received. This form is used as a notice of receipt of goods ordered.

Purpose. In the petroleum industry, the receiving report is used to show materials received from transfers of equipment as well as to show receipt of orders.

Origin. Any point in the business organization that receives materials or supplies may originate the Receiving Report.

Disposition of Copies. This form can be a separate form or a part of the purchasing order. If it is a separate form, multiple copies are prepared for the following purposes:

1. Notice to purchasing of receipt of goods
2. Notice to Materials Control of goods on hand
3. Filed in Receiving Department as a permanent record
4. Authorization to Accounting for payment of invoice

If the Receiving Report is a part of the purchase order, the receiving department ordinarily will have on hand three copies of the order. One copy is returned to purchasing to
be verified against the original and passed to accounting for posting to accounts payable and verification of the invoice. One copy is retained by receiving as a file copy and the last copy is sent to material department with the goods for the use of the materials clerk. The copy sent to purchasing is sometimes routed through materials control for entries in their files and for checking of the order. In other cases, controls sections are notified directly by receiving or indirectly by the stores department.

**Practice of Companies.** The companies whose forms were reviewed all made use of the receiving report. Again, the main difference among the forms was the name and number of copies. The companies used the form in the manner described.

"In the petroleum industry, one copy of the receiving report is retained by the receiving department and two are sent to purchasing. One of the copies sent to purchasing is filed with the order record and the other is attached to the vendor's invoice and sent to accounting."\(^{16}\)

Chapter IV was devoted to an analysis of the forms used in the petroleum industry for controlling equipment and supplies. These forms were presented as a synthesis of practices in the industry and of procedures suggested by authoritative opinion. The specific records were discussed according to the purpose, origin and use of each one. An effort was made to show the records in a general, rather than specific, light. The synthesis of practices will be used as a guide in establishing the model system of forms in Chapter V.
CHAPTER IV

STORES DISTRIBUTION IN THE PETROLEUM INDUSTRY

Problems of Supply in the Oil Field

The basis for control of materials and the forms used in the control were discussed in Chapters II and III. The next step is to apply this to the petroleum industry. The application of the criteria set up in the preceding chapters should make possible the final achievement of the objective of this study, the design of a system of forms for use in the oil business. Before entering into the final phase of the problem, however, an understanding of the methods of supply in the oil fields is needed. The following sections are presented to show some of the problems facing the material supply division of an oil company. The type of equipment used and the purchasing of the equipment are described to provide an understanding of the problem of supply in the petroleum industry.

Supply in the field presents a circumstance that is not normally met in any other industry. Many industries use a centralized control system for controlling stores that has its main office at the home plant and branch offices at other plants within the company. However, the problems presented there are those of controlling a relatively static amount of
stores required for a standardized amount of withdrawals expected.

The oil company has the same situation in that it maintains warehouses of materials and supplies in the several oil fields or leases within its organization, but the movement of supplies about the field or lease is far more complicated than the movement of supplies from a stock room to assembly in a manufacturing plant.

Movement of supplies about an oil field requires a knowledge of the amount of supplies needed, who requires it, where it was moved from, on whose authority it was moved, and the use to which it will be put. The same information is needed in any plant, but in the oil industry the factor of space affects the operation. Within a plant making mattresses for example, the movement of stores is measured in feet; in the oil field the movement may require miles.

The basic product is crude oil, the production of which entails operations at wells; transporting facilities, such as tank car or pipeline; refining; and the sale of the finished product.

**Oil Field Equipment.** The material and equipment needs of the oil producer can best be shown by a brief description of that equipment. The following description is not a complete one, but a representative one. A complete description of the varied equipment used in the production of oil fills a
large catalog. The equipment is of such varied types and makes that an accurate control of it is essential. It was mentioned in an earlier chapter that sometimes each well or lease had to have its own accounting system adapted to it. The same applies to the use of equipment also.

The equipment described here requires the use of forms in its operations. Each addition, replacement, and transfer of the equipment is reflected in the inventory cards and expense accounts related to the equipment.

The operation of the wells may be fairly simple in that some locations afford flowing of the oil. Flowing operations are the result of gas pressure, water pressure, or natural gravity flow of the oil through the soil forcing the oil up to the surface through the well casing. This is the cheapest and easiest method of obtaining the oil as lifting costs are negligible.

The alternate method of getting oil out of the earth is to pump it out. Various methods and pumps are used. There may be a bottom pump seated at the bottom of the well and forcing the oil up; there may be a surface pump lifting the oil up or a hydraulic lift pumping the well. The machines used are as varied as the methods of lifting. Electric, diesel, gasoline, natural gas, butane, steam, or kerosene motors may be used. The pumping jack may be a single rig or a multiple rig utilizing one motor and a system of shackel
rods that operate several wells simultaneously. The system may be automatic, using relays or electric controls to start pumping, pump the desired amount and stop; or, the system may be manually operated by a pumper who lives on the lease and cares for the equipment.

The possible methods of pumping, storing, transporting, and using oil are almost innumerable. However, the systems all have one thing in common; they must be repaired, replaced, and otherwise cared for. This entails expense in the form of labor and materials. Materials must be stored in easily accessible places near to the field of operations. This calls for warehouses, trucks, and crews.

The pumping or flowing of oil from the well is only the beginning of the process as oil is the raw material. There are several phases of operation to be passed before the gasoline, lubricants or chemicals are reached as the end products. Each step in the process involves the use of specialized equipment. This specialized equipment is repaired or replaced by the lease pumper or "gang" of workmen. Crews of repairmen are constantly working on the lease equipment because it must be in perfect condition at all times.

The well itself has fixtures of pipe, fittings, pump, gas separators and other equipment. The flow lines and storage tanks require special equipment such as acid resisting pipe and gate valves. All of this equipment must not only be
kept in constant repair; there must be on hand other types of equipment that might be needed. In the event that a well should quit flowing, a pump must be installed immediately. The materials supply house for the lease does not need to keep an inventory of equipment that is complete for all equipment that is used, but the division warehouse must.

Whatever the situation affecting the repair and replacement of material, there must be prepared a transfer report for the material control section and accounting department. The transfer allows a perpetual record of equipment in use and available for use on each producing property within the organization. Idle material is recorded according to its state of repair. The Mid-Continent Oil and Gas Association established the following standards for grading equipment.\(^1\) New equipment is listed as "A", such material having been purchased for use on a lease but never used. It is transferred at 100% of original value.

Good second hand materials, condition "B", are those that are usable without repair. They are transferred at 75% of value if they were originally new or at 75% of current new price less depreciation charges, these charges consistent with their usage and service if charged to the lease at 75% of new price as second hand materials originally.

\(^1\)Standard Form—adopted by Mid-Continent Oil and Gas Association Committee (1931), as presented by H. G. Humphreys, *The Accounts of an Oil Company*, p. 130
Condition "C" materials are those that are usable only after repair and reconditioning and are charged at 50% of current new prices.

Condition "D" materials are bad order materials not further usable in their original function but may be used for some other purpose. They are transferred at 25% of current new price.

Obsolete or nonserviceable materials are listed as condition "E" and classed as junk for immediate disposal. The disposal of junk is done at the lease and the money credited to the account of the lease where practical to do so.

In the event that materials were used temporarily and the time of use does not call for the application of the above depreciation deductions, the materials are priced on a basis that will leave a net charge against the lease account consistent with the service rendered and adequate for the time the materials were in use.

Supply in the Field. Perhaps the best method of emphasizing the problems of supplying materials to the field is by example. For this purpose, a hypothetical situation will be developed, starting with a requisition and following through to the receipt of the materials at the origin of the requisition.
For the hypothetical case, a two inch valve for a flowing well connection will be requisitioned. The procedure will be discussed from these possible situations: Material not needed immediately, emergency order of the material, and credit purchasing with the emergency order.

The requisition is made out by the pumper listing the type, size, and number of the valve needed. He will retain one copy and send the other to the foreman or supervisor. The supervisor will approve the requisition and forward it to the material clerk at the warehouse. In case the valve is not available at the warehouse, the clerk will then send the requisition to the main warehouse at headquarters. The order is checked at that point against the inventory records and if the valve is available, it is sent out accompanied by a material transfer. Copies of the transfer are sent to accounting, material control, warehouse records clerk, and to the originator of the requisition.

If the valve is not available at the main warehouse, the requisition is sent to the materials control section. Materials Control will check the availability of the items at other company warehouses and forward it to one of them, if transfer of the material from that location would be economical. If the material is unavailable at other warehouses, or shipping charges from that point would be excessive, the requisition is sent to the purchasing department.
Purchasing, upon receipt of the request, will consult their list of vendors, select a suitable one and prepare the purchase order. The purchase order will probably contain nine copies. (The companies furnishing records for this study used the nine-part order in the majority of cases.)

The nine copies of the purchase order may be distributed as follows: The original and one copy are sent to the vendor who returns the second copy as an acknowledgement of the order. Copy 3 is filed in the purchasing department files. Copy 4 is sent to accounting as notice of goods on order. Copy 5 goes to the materials control section as a notice of placement of the order. Copy 6 is sent to the originator of the requisition as notice that the valve will arrive on or about a certain date. The seventh, eighth and ninth copies are sent to receiving. One of these is used as a file copy of material expected, one copy is used to report the material to purchasing and accounting when it arrives, and the last copy is sent to the storeroom with the material when it arrives.

After the receipt of the goods in the receiving department, an inspection report is made up if the goods were made on special order or if it is a type of merchandise that can vary in quality. Following the inspection report, the materials are sent to the materials storeroom where they are entered in the perpetual inventory records and placed in stock.
The requisition that originated the order will be on back order and filled promptly.

The procedure outlined above would apply to equipment that was not needed immediately. In the event that the valve were needed for immediate use, an emergency order would be prepared and the valve purchased by the pumper or his superintendent at a supply house. The emergency order usually consists of four copies. In the case of a cash purchase, the original and one copy are sent to accounting and material control. One duplicate is given the vendor, and one copy is retained at the originating point.

A credit purchase made with the emergency order would entail the same four copies in different routing. Two copies are given to the vendor, one of which is attached to his invoice when billing the company. One copy is sent to accounting and the last copy kept at the originating point.

In the instance of the cash purchase, the movement of the valve would have entailed a transfer prepared by the user of the valve. The transfer would have been sent to the materials control department as a notice of addition to equipment and to accounting as notice of an addition to the lease inventory.

In the instance of the requisition of material from headquarters, the transfer would have been prepared at the warehouse and a copy sent to the requisitioner with the material.
Association of the various departments in the procedures just outlined is shown by diagram on this and the following pages. These diagrams show the relationship of the divisions in the organizational structure of an oil company. Each of these various divisions maintain records of transactions affecting materials.

Figure three shows the routing of the materials requisition and the purchase order through the chain of command in the requisition and purchase of regularly stocked items.

Fig. 3. Requisition and purchase of regularly stocked items in the materials inventory for warehouse locations.
The requisition is routed through each higher echelon to ascertain if the material is available at that point. The purchase order is prepared in nine copies and routed as indicated on Figure three. The transfer is originated at the receiving station as evidence of issue. The receiving report is prepared in duplicate at two points, the receiving department and the requisitioning department.

Figure four outlines the requisition of materials from company warehouses through the use of the material requisition and the material transfer.

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**Fig. 4.**--Requisition of material on hand at warehouse.

The materials requisition and transfer are routed in the same paths as the purchase requisition and transfer; i.e., in the same manner as in Figure three.
Figure five outlines the use of the emergency purchase order by field personnel. This order is not used to buy stock items for warehouses. It is used for purchasing equipment or supplies for immediate use only.

![Diagram showing the routing of forms in an emergency purchase of materials by field personnel.]

**Key:**
- Emergency Order
- Vendor's Invoice
- Materials
- Transfer

Fig. 5.—Routing of forms in an emergency purchase of materials by field personnel.

The emergency order is usually written in quadruplicate. The first two copies are given to the vendor who attaches one copy to his invoice. The third copy is filed and the fourth copy is sent to the accounting department via the materials control section.

Figure six shows the routing of the field transfer, pipe tally, and receiving report a transference of equipment from
one location to another within the premises of the company. Although the pipe tally is used in transfers of equipment that is measured in linear feet, such as pipe; the disposition of the other three forms is the same in all cases.

![Diagram showing the routing of forms in the field transfer process]

**Fig. 6.--Field transfer of materials**

The routing of the forms as presented in the preceding diagrams was taken from the forms as obtained from the oil companies and from information gathered in interviews with clerks at field warehouse locations in the East Texas oil field. Modifications of special company procedures and forms were made in order that the diagrams would reflect the general procedures used by all companies whose forms were reviewed.
Summary

Chapter IV has shown the type equipment that the model forms system in Chapter VI will be called upon to record and control. The equipment and the procedures of supply in the field were reviewed for familiarization with the manner in which a typical oil company might handle them. The general outline of types of equipment used and the hypothetical situation developed have been supplemented by illustrations that show the departments in an oil company and their relationship in the distribution of materials about the operating areas. This chapter was included for a better understanding of the application of the forms to the problem of controlling inventories in the petroleum industry.
CHAPTER V

FORMS CONTROL AND ANALYSIS

Stores control through forms utilized in the accounting process, as presented in Chapter II, is achieved only after careful planning of the forms to aid in the processes in which they are used. It was with that thought in mind that the precepts shown in this chapter were gathered as a practical guide to follow in designing the model system of forms in Chapter VI. Although the forms will be designed primarily to satisfy the requirements of the petroleum industry, certain basic techniques and practices applying to all forms must be followed. Particular emphasis will be placed on the matter of simplicity in the design of the forms. Repeated reference to the need of simple procedures and forms was made in the texts and other material reviewed for this study.

The design of forms according to set rules adopted by one company will not solve the problem for all companies. Each company needs to devise its own procedures to fit its particular situation. The size of the office force, the office machines in use, the size of the company, legal requirements and the like will make each case a different one.

The planning of a control system may be simplified some-
what by the use of general rules formulated by other companies' experiences in their planning. In order to show the phases of seeking and designing the proper set of forms and procedures to fit any company's problem, this section deals with the designing, reviewing, and revising of forms in use or contemplated for use.

**Forms Control in General.** In order to maintain proper control and to facilitate a rapid disposition of the data withdrawn from the forms, there should be a periodic review made of all existing forms. The forms in use may have served their useful lives and no longer be necessary. They may have been adopted during a special time to meet an unusual situation, or the forms may be outdated and in need of revision or replacement.

To assure that the forms are all placed under surveillance, one outstanding authority suggests that they be gathered together and filed according to their function, subject, operation, or condition. These four factors are basic to all office operations and procedures. The Function is a thing to be accomplished or purpose to fulfill. The Subject is the thing about which the action takes place, or in relation to which functions are fulfilled. The Operation is a group of actions or performances which takes place in relation to the subject or function. The Condition is that which defines, limits, or circumscribes the subject, function, and operation.¹

Every business should make some provision for the regular and systematic review of its forms if the organization is to operate effectively. This can best be accomplished if the responsibility for forms control is assigned to one individual or section. The control procedure will vary with the size of the office and number of forms employed, but the basic principles involved in forms control which apply generally are as follows:

1. All forms used by the organization must be subject to periodic review.
2. Standards must be set up and adhered to on all forms.
3. The control must include the authority to determine the physical and functional specifications in accordance with the standards adopted.
4. The control authority must serve as a contributor, rather than as a censor of forms.

As previously mentioned, the first step to take in the establishment of forms control is to file the forms. The forms should be filed according to the forms number or if there is no number, according to the function, department, or similar classification affected by the use of the form. After a file has been established and checked to see if all pieces of paper, in whatever shape that affect office work are included, a list of the uses of the form should be made. This list might well include the origination, number of copies prepared, to whom they are sent, the amount of handling involved, the time retained, how filed, what other forms are used in connection with it, and the number used each year. This information should be written up and filed with the copies of each form. The standards for each form should then be determined and also filed with the forms.

3Ibid., p. 492-494.
"Forms have a tendency to continue indefinitely regardless of their need, and there is also a tendency, almost an obsession, in some instances, to start new forms irrespective of whether the information desired is now contained in existent forms or whether it can be secured by a slight modification of these forms."\textsuperscript{4} The establishment of a control unit or section for the forms will eliminate such undesirables. The forms control section should remember that the forms of an organization will change as the company grows and the forms should be changed to fit the newer circumstances.

The control of the forms having been placed in responsible hands and classified, an analysis should be made of each one. The forms should be considered in the light of being discontinued, combined, or improved. The careful consideration of the forms can lead to savings from forms reduction, which in turn reduces clerical work.

The forms control section or man should consult the various departments and discuss the forms and the work going into them. Forms standards should be set up at this point, the standards to consist of size of the forms, paper stock used in them, and the printing method to be used.\textsuperscript{5}

\textsuperscript{4}George R. Terry, \textit{Office Management and Control}, p. 308.

\textsuperscript{5}For further reference see, \textit{Improved Office Procedure}, American Management Association, New York, p. 10.
Forms Control in the Petroleum Industry. Forms control in the petroleum industry, like materials control, is indispensable to good operations. The diversification of activities and the scattering of various phases of the production departments duties make the use of forms compulsory. Information must be written and passed on to others affected by it. The control of the forms used may save a large organization thousands of dollars each year. The standardization of size, color, paper grade, printing methods and other factors will eliminate unnecessary expenses and allow quantity purchases of paper and printing. The product, oil, is taxed, controlled, supervised and rationed by organizations outside of the industry, and these authorities must receive reports. These reports are prepared from the data on forms. The necessity for control of the forms, therefore, is obvious.

The Design of Effective Forms

Classes of Forms. There are two classes of forms, often designated as external and internal. External forms are those that leave the premises; they are sent to customers, suppliers, or prospects. Internal forms are those that are used within the business among the personnel. All forms should be simple, practical, and easy to use. It should be remembered that forms are tools. Tools are designed to do specific jobs in the most effective manner, therefore the form should be designed to fit the job it is used on.
All forms must be constantly improved and checked for improvement; so that "thought transference", "skill transference", "experience transference" and "information transference" will be speedy, accurate and at the highest point of effectiveness for precision thinking and precision planning. . . . The mission and functional specialization of the form must be planned with consideration to maneuverability, mobility and speed. Also the mission and function of the form must be decentralized with the objective of sudden . . . expansion or contraction.  

According to G. R. Terry, forms design can be divided into mental and physical factors.  
Mental factors pertain to the arrangement of necessary items in such a manner that filling out the form can be done easily, and physical factors pertain to the standards mentioned above, color of paper and ink, size of paper, etc.

There are several factors that should be considered in the design of a form in order that the mental coordination with the physical characteristics of the form may be accomplished. These include, according to Terry:

1. Purpose of the form
2. What information to include
3. Adequate identification
4. Items in logical order
5. General pattern of the form
6. Number of copies and the type of form to be used.

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7George R. Terry, Office Management and Control, p. 293.
8Ibid., p. 294.
Reviewing Old Forms. With the above factors well in mind, the next step is the design of a new form or the review of an old one. If the design of an old form is under review, the following things should be incorporated into the review:

1. Design the form in such a way that the items are in logical order and easy to follow.
2. Plan the form in such a manner that the flow of writing is continuous from left to right or from top to bottom.
3. Reduce the amount of writing to a minimum, if possible use check boxes, abbreviations, codes or contractions.
4. If the form is to be used in a machine, design the spacing to fit that machine.
5. Number the form, its separate copies, and the columns if necessary to facilitate accurate distribution and use of each part.
6. Make the size of the form as small as possible, assuring that it will print or cut from standard size paper and can be filed in the filing equipment available.9

Designing a New Form. The design of a new form entails several factors that must be carefully watched to achieve the best results. As a guide to the steps to follow in preparing a new form, consider the form for its correctness:

1. As to identification of form
2. As to filing reference data on form
3. As to arrangement within body of form
4. As to instructions for use of form
5. As to form dimensions, borders, edges, bindings, and backs
6. As to paper stock for form
7. As to reproduction of blank copies of form
8. As to form control.10


10For an inclusive discussion of these factors see: George W. Peak, "Standards for Business Forms," Office Management and Control, March, 1946, p. 33.
A check list that will help to complete the form is given by Hammermill Paper Company as:

1. Necessity
2. Purpose
3. Size and arrangement
4. Wording
5. Paper and printing

The above considerations will not be fulfilled at the completion of the first trial form. The form will in all likelihood be revised several times before the final form is reached. The main thing is to avoid having too many printed at one time until the form is in final shape. It is wise to have only a few copies made up at a time by some inexpensive method such as mimeograph or hectograph. In this way several variations of the form can be tried before printing orders are placed.\(^\text{12}\)

Simplicity in Records

"Simplification may be defined as that policy of management which seeks to conduct all activities and functions of the enterprise in the least elaborate manner consistent with any given purpose."\(^\text{13}\)

Simplicity as defined above is necessary if a company of any size is to maintain its growth. The number of employees

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\(^{11}\) Hammermill Paper Company, Form check list, part 1.

\(^{12}\) G. L. Harris, "You Can Save Money on Your New Forms", Office Management, October, 1947, pp. 69-72.

\(^{13}\) Ralph C. Davis, Industrial Organization and Management, p. 396.
increases proportionately to the size of the organization. Any simplification of procedures that can be effected will result in better morale among the clerical staff. Other than the stimulation of the clerical force, the simplification of forms, routines, and procedures will result in a reduction in operating expenses, an improvement in the customer service of the organization, and aid in the development of better executives.

"Let me say one thing about forms control. It isn't the cost of the paper. It isn't what is on it that is costly. It is the manner in which the material is put on the paper that is costly."14

The layout of the form as regards the flow of writing is important in saving time. Forms that are supplemental to one another should be arranged in like manner so that they may be compared or information copied from one to the other in the same sequence.

In developing a system of material control, unfortunately the tendency is to devise an elaborate system requiring a lot of unnecessary forms. The result is that while the system looks perfect on paper, it involves too much "red tape" in practice, so defeats its own purpose. The test of a system of material control is, first, does it do the work for which it was devised, and second, is it done in the simplest way and what is the cost of maintaining the system? . . . . The simplest system with the least number of forms which will fit the particular needs is the system to adopt.15


"All forms, records, and reports are the reflection of clerical activity, and unnecessary forms or duplication of forms and reports lead, in turn, to unnecessary work or duplication of work. No clerical activity is completely efficient unless the forms and reports through which this clerical activity reflects itself are rigidly controlled in relation to the procedure involved."\[16\]

According to G. R. Terry, the purpose of forms is to give official sanction, provide for repetition, eliminate copying, insure uniformity, serve as work guides, and implement mechanical operation."\[17\] If the forms in use do not meet these requirements, they should be reviewed and revised or replaced.

**Simplicity of Record in the Petroleum Company.** Applying the foregoing conclusions calling for simplicity in the make-up of forms to the petroleum industry, we find that the basic principles are the same. An organization such as a large oil company cannot afford delays or confusion resulting from complicated forms and procedures. "A large integrated oil organization has the accounting problems of a merchant and a manufacturer, as well as those of a producer."\[18\]

The ultimate good health and financial gain of an oil company is dependent upon complete


coordination between all departments for the proper recording of field activities.

There is a wide difference between the interest and attitude of the field personnel and the accounting personnel. The primary concern of the field men is to produce the oil, and this requires the employment of numerous operations. The accounting department represents a scientific system of recording these activities, but it is dependent upon proper cooperation and information from the rest of the organization. . . .

Needless copies of forms filed are a waste of space and needless forms prepared are a waste of clerical time. In the texts listed in the bibliography, the need for simplicity and correlation of information on forms was stressed. The majority of the forms received from oil companies reflected this theme of accurate records without swamping the departments with extra paper to handle and file. The operations of all the companies are similar, but variations among them were found. The variations were for the most part effected through conscientious effort to reduce clerical activity. As an example, one organization combined the transfer, the pipe tally and the trucking and hauling report into one form. This combined form eliminated the cost of separate printing, and the separate preparation of forms that accompany one another in a transaction. The forms reviewed indicated the truth in this statement:

Whether the oil production office be small or large, the bookkeeping and accounting principles are similar. The application of

them varies only in the extent and volume of work and in the number of persons required to handle it.\textsuperscript{20}

It should be remembered however that oversimplification can be more harmful than helpful. In one instance cited by K. L. Boosey,\textsuperscript{21} a firm bought a form to be used as a bookkeeping medium. The sales ticket was to be used as the basis of the "new" system. The slip was fine with the exception of the fact that it provided no record of customers to the home office on cash payments, it did not allow a copy for the field office where collections originated, and the only record of sale was in the salesman's pocket on the sales duplicate. This oversimplification is an example of a good form put to a use for which it was not intended.

The factors of price of printing, cost of paper used, and savings in quantity buying of forms are important, but the main considerations to be given any forms system are those given by G. R. Terry on page three. Interrelations of all departments should be applied to the use of the forms. All transfers of information should be accomplished with as few forms as possible to meet legal, accounting, and recording requirements.


Chapter V is comprised of several phases of forms control and analysis. The control of forms has been studied in a general light and as applied to the oil business. The design of effective forms has been considered for both old and new forms. Simplicity in the design and use of the forms stands out as a basic requirement for forms in general and as a requirement for forms in the petroleum industry.
CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Chapters I through V have been used to establish the basis for designing a model system of forms to be used in the control of materials and supplies in the production department of an oil company. Basic considerations of stores control through the use of forms, records used in controlling stores, stores distribution in the petroleum industry, and the control and analysis of forms have given a background in the fundamental approaches to solving the problem. The general rules for designing a forms system, as outlined in the preceding chapters, will be adapted to the particular needs of an oil producer for controlling materials transactions.

The factors of space and distance create problems of supply in the petroleum industry that are seldom encountered in other types of business. Other factors met are the heavy expenses of operation, the large investment of capital, the many types of equipment required, and possible losses through depreciation or obsolescence. All of these factors point to the need—and suggest certain of the essential characteristics--of a carefully designed material control system for any given firm in the petroleum industry.

A model system of forms which incorporates the above-mentioned considerations will therefore be presented and described in this final chapter of the investigation. Since earlier
sections have been pointed toward the model system, its presentation will constitute the conclusion of the study. It is believed that any individual firm in the petroleum industry might find the proposed system a useful guide when designing a new materials control system or revising an old one.

A Suggested System of Forms for Stores Control

The system as devised for the control of materials and equipment in the petroleum industry consists of ten forms. These forms, and the number of the pages upon which they appear, are as follows:

1. Materials Requisition, page 83
2. Purchase Order, page 84
3. Emergency Order, page 87
4. Pipe Tally, page 98
5. Material Received Report, page 89
6. Warehouse Stock Card, page 90
7. Idle Material Card, page 91
8. Producing Property Equipment Record, page 92
10. Material Transfer, page 93

These forms were selected from the practices of the oil companies whose forms were reviewed and from the suggestions of authorities in the field of oil field accounting. The particular items of information included on each form represent a synthesis of items common to each form among those reviewed.
Special items of information on the forms of the various companies were not included because they were adaptations to one system and not to the system in general.

The mental and physical factors as referred to in Chapter V were considered in the design of the forms for this model system. The mental aspects of forms are involved chiefly in the choice of items to be included. These items were selected on the basis of their frequency of use by the companies and their importance to the use of the forms as recommended by authoritative opinion.

The physical factors, on the other hand, necessitate reference to the principles of forms design as formulated by authorities in such fields as office management, cost accounting, purchasing, production control, clerical procedures, and oil field accounting. These factors are: size of the form, color of ink, color of paper, etc. However, only the size of the form is considered here. It is felt that the color system for identification of copies, reduction of eyestrain, and the like are items that must be adapted by the individual company to fit its particular needs.

The 8½ by 11 inch form was adopted for the purchase requisition, purchase order, transfer, emergency order, and receiving report. These forms are often filed together and uniformity of size prevents bunching of odd sized forms in the file.
The inventory cards for warehouse stock, idle material and producing property equipment are designed for an 5 by 8 inch card. This size is easily adaptable to Wheeldex, Videx, or other visible index files. However, the forms may be printed on any size card to conform to the system in use at any company.

The bin tag may be on any size shipping tag convenient for use and economical in printing. The pipe tally is designed as a 4½ by 7½ inch form to be bound in the manner of a sales book for the convenience of the personnel using them in the field.

Documentation of the forms will be comprised of footnote reference to the companies whose forms were used and to the authorities whose texts were used in formulating the particular form presented.

Material Requisition. The requisition is a combined form that may be utilized either for the requisition of materials from stock or as a purchase requisition for requesting purchase of equipment. The form is made up of two parts, copies of which are to be routed as follows: Copy one is sent to the warehouse and copy two is retained at the originating point in requisitions of materials from warehouse stocks. If the material is not available at the local warehouse, the form is sent to materials control for a check on the records at other lease or division stocks on hand. If there are no
supplies of the material on hand, the requisition is sent to
the purchasing department as a request to order the material.

<table>
<thead>
<tr>
<th>MATERIALS REQUISITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
</tr>
<tr>
<td>(name of company and division)</td>
</tr>
<tr>
<td>Ship to:</td>
</tr>
<tr>
<td>Ship Via: Express</td>
</tr>
<tr>
<td>Freight</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>QUANTITY</td>
</tr>
<tr>
<td>SYMBOL</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Fig. 7.--This materials requisition form was taken from
the following sources: Halliburton Oil Well Cementing Com-
pany, HOWCO form 372; Gulf Oil Corporation, forms 2010-E and
HT 2307-A; Texas Gulf Producing Company, requisition form;

The outlay of the requisition utilizes the spacing for
a pica typewriter. The items in the heading are double spaced
for either typing or writing with pencil or pen. The columns
are arranged for four tabulator stops.
Purchase Order. The purchase order is a nine part form that follows the standards set by the National Standard Zone System for Purchase Order and Inquiry Forms. (see Chapter III) The form is arranged for double spacing on a pica machine.

<table>
<thead>
<tr>
<th>PURCHASE ORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchaser:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>P.O. No.:</td>
</tr>
<tr>
<td>Vendor:</td>
</tr>
<tr>
<td>Req. No.:</td>
</tr>
<tr>
<td>Ship to:</td>
</tr>
<tr>
<td>Location:</td>
</tr>
<tr>
<td>In Care of:</td>
</tr>
<tr>
<td>Via:</td>
</tr>
</tbody>
</table>

(Terms of Purchase)

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
</tr>
</thead>
</table>

(BODY OF FORM)

Charge:  

purchasing agent

Fig. 8. --Purchase order form
The nine parts of the form are to be routed as follows:

Copy 1. Vendor's copy. It is mailed to the vendor as evidence of the contract and as an order for the material.

Copy 2. Acknowledgement copy. It is mailed to the vendor to be signed and returned as the buyer's evidence of the contract and the expected date of arrival of the goods.

Copy 3. Requisitioner's copy. This copy is sent through the materials control section for posting to the On Order column of the Equipment Records. After its use in the control section, the form is sent to the requisitioner as notice of the future arrival of the goods.

Copy 4. Purchasing Department copy. This copy is filed under the name of the vendor.

Copy 5. Follow-up copy. This copy is filed according to the expected date of arrival. It is another Purchasing Department copy and is used for reference in correspondence to the vendor concerning the order.

Copy 6. Accounting Department copy. This copy is used by Accounting to record goods on order and verification of the invoice upon receipt of the goods.

Copy 7. Receiving Department copy. This copy is filed in a tickler file according to the date of expected arrival of the goods and is used in making out the material received report. The quantity and price of the material are not written on this copy. The receiving clerk fills out those columns upon receiving the items. This practice affords a check on the invoice.
Copy 8. This copy is sent to the receiving section with copy seven. The eighth copy is sent to the warehouse with the materials when they leave the receiving section and is filed in the permanent files there.

Copy 9. This copy is also sent to the receiving section where it is used as a check list for the material and is signed by the warehousemen receiving the material from the receiving section.2

Emergency Order. The emergency order is a four part form used for the purchase of materials from local supply houses in the event that the equipment is not readily available from company stocks and is needed immediately.

The four copies will ordinarily be disposed of as follows:

1. Cash purchase. In case the material is paid for by the purchaser, two copies of the order are given to the vendor. One of the vendor's copies is to be attached to his invoice in shipping the goods. The third copy is mailed to the materials control section for entry into their records and forwarded to accounting. The fourth copy is retained at the originating point as a permanent record.

2. Credit purchase. If the material is not paid for by the purchaser when it is received, the first two copies are

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2The information for preparation of this form was taken from the following sources: How to Cut Purchasing Department Costs, Conover-Mast Publications, publishers of Purchasing, p. 132; L. P. Alford and J. A. Bangs, Op. Cit., p. 303; Gulf Oil Corporation, form H 132 H; Phillips Petroleum Company, form 58; Standard Oil Company of Texas, form GO-5-TX, August 1949.
used differently than for a cash purchase. Only one copy is given the vendor and the second copy is mailed to the accounting department for entry into accounts payable. The last two copies are disposed of in the same manner as for a cash purchase.\textsuperscript{3}

---

**EMERGENCY ORDER**

<table>
<thead>
<tr>
<th>CHARGE</th>
<th>major account</th>
<th>account no.</th>
<th>A.F.E. no.</th>
<th>item no.</th>
<th>code</th>
<th>well no.</th>
<th>job no.</th>
</tr>
</thead>
</table>

**QUANTITY**

**DESCRIPTION**

**PRICE**

---

Issuing authority

Fig. 9.--emergency order for buying items for immediate use in the field.

\textsuperscript{3}Figure 9 taken from the following sources: R. M. Pitcher, *Practical Accounting for Oil Producers*, p. 461; Magnolia Petroleum Company, Form X-2560; Gulf Oil Corporation, Form H 1151-D; Halliburton Oil well Cementing Company, Form 3.
Pipe Tally. The tally sheet is used to accompany the material transfer when the material is comprised of pipe or other material that is measured in feet. It is prepared in duplicate. One copy is retained at the shipping point and the other is attached to the material transfer accompanying the material shipment. Another tally is prepared and attached to the receiving report at the receiving point to be mailed to materials control and accounting.\(^5\)

<table>
<thead>
<tr>
<th>From</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>To</td>
<td>Size</td>
</tr>
<tr>
<td>Via</td>
<td>Class</td>
</tr>
<tr>
<td>Car no.</td>
<td>Kind</td>
</tr>
<tr>
<td>Transfer no.</td>
<td>Make</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order no.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Pieces</th>
<th>Ft. in.</th>
<th>Ft. in.</th>
<th>Ft. in.</th>
<th>Ft. in.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**(BODY OF FORM)**

TOTAL

To be used for

Tallied by

---

\(^5\) This form designed from: R. M. Pitcher, Op. Cit., p. 239
Material Received Report. This form is prepared in duplicate as evidence of receipt of goods at the warehouse or lease. The first copy is mailed to the materials control section and accounting. The second copy is retained as a file copy at the receiving point. It is comparable to the transfer. One company contributing to this study made use of a single form for both functions. 

<table>
<thead>
<tr>
<th>MATERIAL RECEIVED REPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHR No.</td>
</tr>
<tr>
<td>Warehouse</td>
</tr>
<tr>
<td>Vendor</td>
</tr>
<tr>
<td>(field, division, etc.)</td>
</tr>
<tr>
<td>(name and address)</td>
</tr>
<tr>
<td>Shipper</td>
</tr>
<tr>
<td>Containers</td>
</tr>
<tr>
<td>Via</td>
</tr>
<tr>
<td>Delv'd by</td>
</tr>
<tr>
<td>Req. No</td>
</tr>
<tr>
<td>Warehouse Reference</td>
</tr>
<tr>
<td>ITEM</td>
</tr>
<tr>
<td>received</td>
</tr>
</tbody>
</table>

**Body of Form**

Remarks | Receiving agent

Fig. 11.—Material Received Report

6 Taken from: Gulf Oil Corporation form H 2149-A and Humble Oil Company, form A-5 revised DH 4082
Warehouse Stock Card. This inventory card is used in the warehouse as a perpetual inventory record. Each receipt, apportionment, or issue of materials is entered on the card. A separate card is provided for each item in the stores.  

WAREHOUSE STOCK CARD

Description

Stock no.

Size

Unit

Unit weight

Minimum

Maximum

DATE | ON ORDER | REQ. NO. | UNIT PRICE | RECEIVED | ISSUED | ON HAND

(BODY OF FORM)

Fig. 12.—Warehouse Stock Card for maintaining records of inventories.

Idle Material Card. This record is kept in the materials control section as a record of all material, new and used, that is not in actual use on the producing properties. Entries are made from transfers and receiving reports. The card is filed according to the type of equipment in a file maintained for each lease. The principal purpose of the idle material records is to keep up with loose equipment on the leases in such a manner that excessive inventories may be avoided. Idle material is transferred to locations requesting issue or purchase of such equipment. The material section

The warehouse stock card was taken from the following sources: Halliburton Oil Well Cementing Company, form 791, Humble Oil Company, form P-1139, Standard Oil of Texas, form GO-96, Magnolia Petroleum Company, form X-1132.
is responsible for keeping the inventories at a low level in quantities of idle equipment.9

IDLE MATERIAL RECORD

<table>
<thead>
<tr>
<th>Description</th>
<th>Stock no.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Class of M't'l</th>
<th>RECEIPTS</th>
<th>ISSUES</th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>date rec'd</td>
<td>location</td>
<td>quant</td>
</tr>
<tr>
<td></td>
<td>from (lease)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BODY OF FORM

forwarded to card no.

Fig. 13,--Idle Material Card

Producing Property Material and Equipment Record. This card record is maintained by the materials control section as a means of knowing at all times the equipment on the various properties that is in use. It is used to keep a record of warehouse stocks as well as the equipment in use at the wells. The record is the same as that to be found at the warehouses and leases and should agree with them at all times. The card form used is the same as that of the preceding inventory cards with a few minor exceptions. The form presented here was taken from the same sources as the preceding inventory cards.

The above card form was designed from information from the following sources: Gulf Oil Corporation, form H.T. 2012; Phillips Petroleum Company, form 103, revised; Remington Rand, catalog form number 1-5518; Wheellex, form 01554; and from R. M. Pitcher, Op. Cit., p. 234.
MATERIAL AND EQUIPMENT RECORD

<table>
<thead>
<tr>
<th>Item No.</th>
<th>(location)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class of Equipment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE</th>
<th>ORDERS &amp; RECEIPTS</th>
<th>ISSUES</th>
<th>ON HAND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trans. No. Rec'd From</td>
<td>Quantity Ord. Rec'd</td>
<td>UNIT COST</td>
</tr>
</tbody>
</table>

(BODY OF FORM)

Fig. 14.—Producing property equipment inventory card.

**Bin Tag.** The tag is attached to the material at the receiving station for identification purposes. It is also used in the storeroom for marking materials in the bins. Its use allows ready identification of goods and means of locating the goods in the storeroom.

![Bin Tag](image)

Company Part No.__________
Vendor's Order No.__________
Description__________

Fig. 15.—Bin Tag

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10 Halliburton Oil Well Cementing Company, Form HOWCO 855; Phillips Petroleum Company, Form 21.
Material Transfer. The material transfer is used to record the movement of material and equipment from any point within the organization to another. It is a three part form routed as follows:

Copy one is mailed to materials control for entry into the inventory cards, thence to accounting for charging the value of the equipment to the appropriate account.

Copy two is sent along with the material to be signed and returned to the originating point.

Copy three is retained as a file copy at the shipping point.

<table>
<thead>
<tr>
<th>Material Transfer</th>
<th>MT no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
<td>Date</td>
</tr>
<tr>
<td>To</td>
<td>Req. No.</td>
</tr>
<tr>
<td>Via</td>
<td>Order No.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shipping District</th>
<th>Receiving District</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Material</td>
<td>Initial Installment</td>
</tr>
<tr>
<td>Used Material</td>
<td>Replacement</td>
</tr>
<tr>
<td>Replaced Material</td>
<td>Repairs</td>
</tr>
</tbody>
</table>

(was used for) (to be used for)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>COND.</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>AMOUNT</th>
<th>DISTRIBUTION</th>
</tr>
</thead>
</table>

(BODY OF FORM)

Fig. 16.—Material Transfer. Used to report movement of materials about company properties.
RECOMMENDATIONS

The system of forms presented in this study necessarily has depended for validation upon documentary evidence and upon a synthesis of current practices used and recommended by leading oil companies. It is felt that further study in connection with the problem would be advantageous if the limits of time and cost were overcome. The proposed model system might be taken to many firms in the petroleum industry and the opinions of their materials control personnel sought as to its adaptability to their particular accounting system.

Another method of further investigation would be to install the system in one or more firms and test its workability under actual conditions met in the operation of the business. It should be remembered, however, that neither this system nor any other would completely satisfy the requirements of all oil companies. Each company operates according to its own needs and organizational arrangement; therefore, changes would have to be made in the system prior to installing it to handle a given set of conditions.


Davis, Ralph C., Industrial Organization and Management, New York, Harper and Brothers, 1940.


"How to Design a Business Form", Hammermill Paper Company, 1946.


Improved Office Procedures, Office Management Series 103, American Management Association, 1944.


Koepke, Charles A., Plant Production Control, New York, John Wiley and Sons, 1941.


Lawler, Paul F., Records for the Control of Growing Manufacturing Enterprises, Boston, Graduate School of Business Administration, Harvard University, 1947.


Materials Procurement and Control, Production Series, Number 133, American Management Association, 1941.


Modernizing Manufacturing and Production Controls, Production Series Number 122, American Management Association, 1947.

Neuner, John J. W., Industrial Cost Accounting, Chicago
Richard D. Irwin, Inc., 1942.

Neuschel, Richard F. and Johnson, J. Tallman, How to Take

New Controls for Fixed and Variable Costs, Production Series,
Number 178, American Management Association, 1948.

Noble, Howard S., Karrenbrock, Wilbert W., and Simons, Harry,
Advanced Accounting, Cincinnati, South-Western Publishing
Company, 1941.

Odell, Margaret K. and Strong, Earl P., Records Management
and Filing Operations, New York, McGraw-Hill Book Company,

Office Methods Research and Planning, Office Management Series,
Number 122, American Management Association, 1948.

Owens, Richard N., Management of Industrial Enterprises,

Press Company, 1943.


Peak, George W., "Standards for Business Forms", Office

Peak, George W., "Standards for Forms Manuals", Office Manage-
ment and Review, Vol. 29 (April, 1946).

Pitcher, Robert M., Practical Accounting for Oil Producers,

Pogue, Joseph E., Economics of the Petroleum Industry, New

Rautenstrauch, Walter, Principles of Modern Industrial Organ-

Rowland, Floyd H., Business Planning and Control, New York,

Sexton, William E., "Points to Watch in Forms Control", in
American Business, February, 1948, as reviewed in The


