STANDARD PROCEDURES IN INDUSTRY

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THESIS

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STANDARD PROCEDURES IN INDUSTRY

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I. INTRODUCTION

In any industrial or business enterprise there are two fundamental or basic problems. These are organization and operation. Control and Procedure are the basic factors in the field of operation.

A procedure is simply a method, manner or way of proceeding in a process or course of action. More specifically it is a specification of the methods and conditions of performance of activities for the completion of a specific project. Procedure and control are closely related since the former must be so designed that it assists in the accomplishment of control, i.e., the process of regulating activity.

A procedure introduces orderliness and uniformity, facilitates the determination of skill and knowledge requirements, provides opportunities for specialization and better utilization of human abilities and relieves the executive of many routine phases of planning and control, freeing him for more creative activities.

Procedure should represent the one best method, insofar as practicable. The more it is possible to standardize factors and functions, the more this becomes true. However, a procedure produces results only so far as it is soundly conceived and properly applied by the individuals and groups composing the organization.

II. DEFINITIONS OF TERMS

There are many terms in common usage relating to methods, and many definitions have been offered by authorities in the field of

engineering and management. As evidence of this fact the following chart was prepared, and the following definitions derived in an attempt to better express and interpret the subject.

Standard procedure: A practical written outline specifying policy, the method to be followed with the steps listed in sequence and aided by charts, the forms, supplies and equipment, and the individuals or groups necessary for the efficient and economical performance of related clerical or managerial tasks.

Note that this is a definition of a standard procedure and it should not be confused with the definition of "procedure" which has a broader connotation as already given. "Standard practice instructions" instead of standard procedure is sometimes used by authors, but, as shall be seen, a standard procedure should be more than an instruction.

System: A group of related policies and procedures, or rules and regulations, i.e., organized work.

Routine: A task or series of tasks frequently repeated.

Control: A system used to constrain and regulate activity.

Policy: A principle used as a guide to govern actions.

Function: A phase or part of the work of an enterprise, group, or individual.

Refer now to the illustration on the following page which shows the relationship between these terms as used herein.

CHART SHOWING VARIATIONS IN DEFINITIONS OF TERMS

BOOK TITLE AND AUTHOR	STANDARD PROCEDURE OR PROCEDURE	SYSTEM	ROUTINE	FUNCTION	PROCESS	STANDARD	POLICY
WEBSTER'S DICTIONARY	(PROCEDURE) Manner, method or way of proceeding 2. Customary method. 3. Continuance of a process or operation	Regular method or order as to have system in one's business	1. Regular course of business or official duties. 2. Any regular procedure adhered to by habit	1. Action, performance. 2. Official purpose, office, duty 3. Profession, occupation.	Act of proceeding progress, advance A series of actions or operations definately conducing to an end.	That which is established by custom, authority or general consent as a model or example; criterion	1. Management or procedure based primarily on material interest, rather then on higher principles 2. A settled course adopted and followed by a body or individual
BUSINESS ORGANIZATION AND OPERATION R.C. DAVIS	Structure of concurrent and sequencial relationships in performance between functions, faculties and physical factors underlying the completion of a project with specifications for the effective & economical performance of those functions.	Refers to formal stated and standardized procedure.		Any phase in the work of an organization clearly distinguishable from another phase.		(Quotes Webster)	Principles and rules of action that act as directives guiding us to our objectives in the light of our ideals.
PRINCIPLES OF BUSINESS ORGANIZATION W.R. SPRIEGEL	For the purpose of emphasizing the structural relationship between men, materials and management. Is dynamic...	The standardization of business procedures Tool of management and subsidiary to organization.		Any activity of an enterprise necessary for the continuity of the enterprise and that can be clearly differentiated from other activities			
SCIENCE OF PRODUCTION ORGANIZATION ANDERSON AND SCHWENNING (Quote many authors)		"Orderly arrangement of parts" "Method pursued in carrying out tasks and mechanism or process by which efforts are standardized or unified" Normal routine by which business operations are carried on and controlled "Composed of interdependent routines." Method doing work divisible into several well-defined and established routines or procedure.	"Regular habitor practice, a course of business or official duties regularly pursued" A standard practice or way of performing some function or some transaction.	Functions are united in parallel each contributing at the same time. Opposite of process which are in sequence.	Processes, operations and performances refer to work accomplished and should be distinguished from systems, routines and procedures which relate to the method of doing the work.		
INDUSTRIAL ORGANIZATION AND MANAGEMENT W.B. CORNELL	Methods of activity	Planned methods of procedure.					
(See individual column)	OFFICE MANAGEMENT CL MAZE Method or way of doing something, of carrying through a function, generally outlining it in a step-by-step routine.	PRODUCTION HANDBOOK LP ALFORD & JR BANGS Normal routine by means of which the activities of an industrial organization are carried on and controlled.	TEXTBOOK OF OFFICE MGT. LEFFINGWELL & ROBINSON Series of steps in the performance of work, each step being performed in the same order or way every time.		PRODUCTION HANDBOOK LP ALFORD & JR BANGS (Relate process to manufacturing and procdures to office functions)	TEXTBOOK OF OFFICE MGT. LEFFINGWELL & ROBINSON Carefully thought out method of performing a function, or carefully drawn specification	PRODUCTION HANDBOOK LP ALFORD & JR BANGS Precepts by which all administrative and operating decisions are determined so that the progress and development of the enterprise will be properly directed toward definite objectives.
DEFINITIONS AS USED IN THIS THESIS	A practical written outline specifying policy, the method to be followed with the steps listed in sequence and aided by charts the forms, supplies and equipment, and the individuals or groups necessary for the efficient and economical performance of related clerical or managerial tasks	A group of related policies and procedures, or rules and regulations, i.e., organized work.	A task or series of tasks frequently repeated.	A phase or part of the work of an enterprise, group, or individual.	A series of actions or operations intended to directly change or inspect the physical or chemical characteristics of a product or part.	Requirements or specifications carefully established.	A principle used as a guide to govern actions.

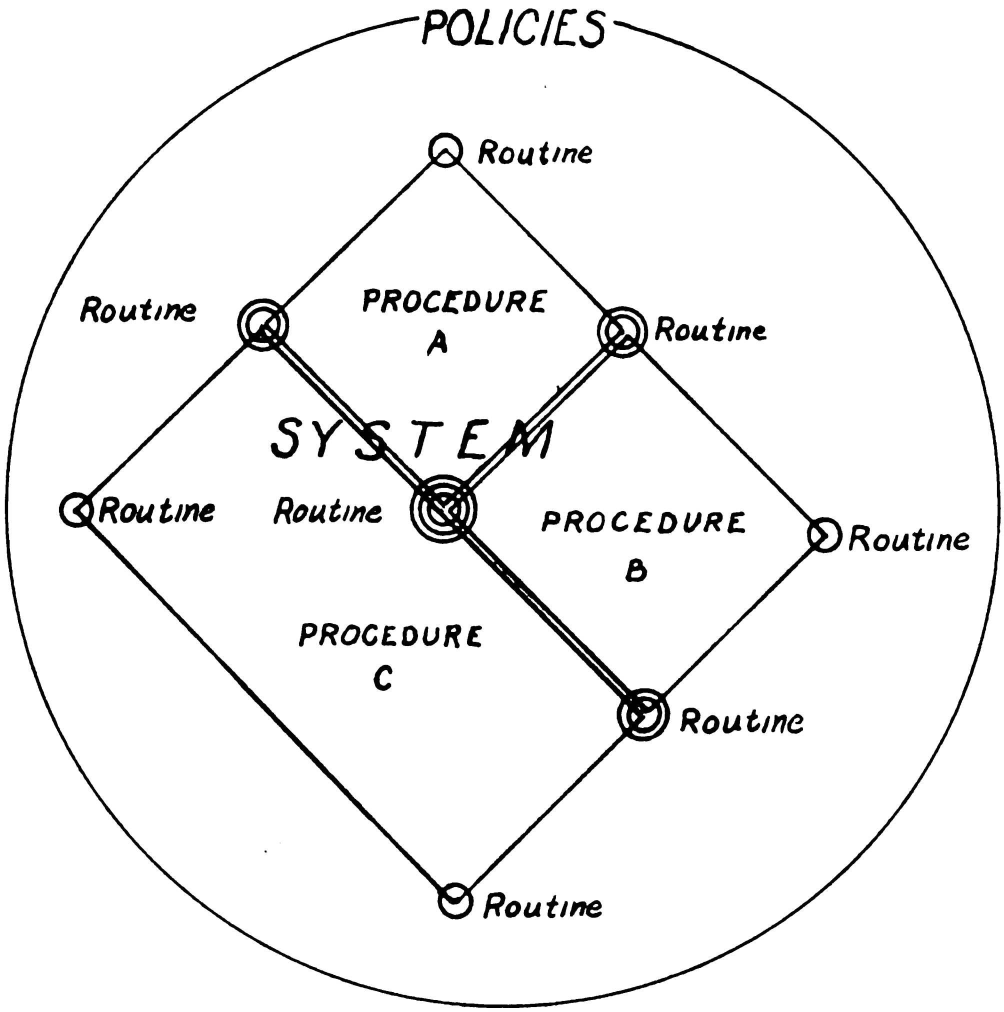

CHART SHOWING RELATIONSHIP
OF TERMS AS USED IN
THIS THESIS

III. GENERAL REQUIREMENTS OF A SOUND PROCEDURE

The primary purpose of a procedure is to facilitate the final objectives of a project in the most effective and economical manner. To be sound a procedure should:

1. Specify order of performance. A practical outline of the various steps in sequence should be presented.
2. Specify necessary materials and equipment. This will include machines, forms, supplies, etc.
3. Specify the relationships between (1) the steps or order of performance, (2) the human faculties, and (3) the materials and equipment.
4. Place responsibility, i.e., state positions in the organization whose duty it will be to follow the steps and use the facilities.
5. Have flexibility, stability, and balance. Flexibility means that it must accommodate itself to temporarily changed conditions without serious loss of effectiveness. It must cope with seasonal changes, temporary interruptions, and other variations that may come up.

   Stability means that fundamental changes are made only in response to fundamental changes in conditions.

   Balance means that the procedure should have equally adequate provisions for the performance of each step. Overemphasis should not be made on any step, such as the use of unnecessarily expensive equipment. As performance in the

execution of like projects become more continuous, it is more necessary to achieve a proper time balance, as well as work balance in the steps of the procedure. In general, the extent to which it is possible to establish a proper time balance in procedure varies directly with the amount of work and the degree of standardization.

6. Provide for proper initiation and closure of action for each step as well as for the project as a whole. Clarity must be made as to when the action should be taken.
7. Be as simple and economical as is consistant with effectiveness.

IV. THE PROBLEM OF DELEGATION

A most challenging problem of management is to give authority to those capable of exercising it and yet retain control in the hands of those ultimately responsible. If management is to function effectively, devoting its major attention to planning, directing, and co-ordinating activities, it must be freed at every level of the unnecessary burden of detail.

This burden is generally associated with approvals; it is lightened to the degree that authority for final approval is delegated to others. Usually it is not from choice that executives become buried in detail; they are more often the victims of an inadequate system of control. They cannot safely delegate the authority reposed in them because there is no adequate means of control which permits this to be done.

The obvious remedy for this situation is the installation of procedures and limits designed to control the use of delegated authority.

V. PROCEDURAL INSTRUMENTS

Many of the factors that enter into the design and operation of procedures are peculiar to the specific conditions under which they must operate. One group of factors, however, is the procedural instruments that are employed in procedure operation. These may be classed as (a) orders, (b) means of communication, (c) reports, and (d) records.

A. ORDERS: Any position carries authority and responsibility. When an order is given, authority is delegated from a person in a higher level to one of a lower level in the organization. The person receiving it gets not only authority but responsibility for doing the job and of reporting its accomplishment. The delegator does not escape responsibility, but his responsibility changes from personal responsibility to supervision, and the area of accomplishment is multiplied by the number of people commanded and by the advantage of coordinated work. This advantage is that total accomplishment is greater than the sum of individual accomplishments.

An order may be given in writing or orally.

A standard procedure is a type of written order and so it is this particular instrument that is of greatest importance in so far as this thesis is concerned.

Policy, it appears, is a limiting order that defines an area of activity. At the top level it is a broad statement of aims and objectives. Passing down through the organization, it becomes increasingly specific and limited and is primarily useful in handling matters that are not routine. A standard procedure then is not a policy, but it assists in establishing policy by pointing out exceptions or variations.

1. REQUIREMENTS OF AN ORDER: An order, and so a procedure, must include "direction" and "instruction." Direction is the telling of what to do and when; "instruction" is the telling of how to do it. Instruction is teaching, the telling of how and preferably why to do something.

Instruction in basic principles rather than in work methods is called "indoctrination." The purpose is to set up in the minds of those indoctrinated a background of sentiment that will cause them to obey orders and commands without question under emergency situations or to tend to follow a traditional path if there are no orders.

Instruction carries a special kind of authority; that of "know how" instead of direct authority. Direction usually carries the authority of command. Interpretation is a special aspect of direction and is sure to be required where policy that is stated in general terms is translated into action.

Finally an order includes "command." Neither instructions nor directions necessarily involve action. They are designations or specifications. Command is the sign that a project has matured and that the time is ripe for execution. When instructions and directions have been coordinated and issued for a whole series of parallel and sequential acts, a standard procedure or group of procedures is produced. In such a case commands are inferred by the occurrence of certain events. Command is automatic when the procedure has become routinized.

A proposed routine or procedure that has not and may never be incorporated into a system is known as a "directive". It may be required in a temporary or unexpected situation and it may be desirable not to establish it as permanent. It should carry an explanation so that, once it has been issued, it can become part of policy if the occasion is

successively repeated. If it is an exception, there should be a note so stating. Directives should be at a minimum.

Oral orders and instructions frequently are necessary but there are inherent weaknesses. The probability of inaccurate statements of direction is greater, they are less likely to be thought out thoroughly, and are more likely to be incomplete. Consequently, the possibility of misinterpretation, and the difficulty of enforcing accountability are greater. If the order is transmitted a second time, there may be a progressive loss of accuracy. If transmission is repeated often it may be distorted to the point of defeating its original purpose. It is usually good practice, therefore, to have oral orders repeated back by the recipient. As with directives, oral orders are given in emergencies. Their use should be minimized.

B. MEANS OF COMMUNICATION: The communication system of an organization is similar to the nerve system of the human body. It is a means for the transmission of orders from the point of decision to the point of action and also of all necessary information throughout an association.

The importance of means of communication is suggested by the number and variety of oral and mechanical communication devices that are available commercially. Speed and accuracy of transmission are important factors in the operation of procedure and their importance increases with increasing centralization of control in an organization, or with increasing functionalization with organization growth.

C. REPORTS: A report is a statement of fact or opinion, or both, giving an account of certain factors, conditions and activities, that is rendered to some responsible authority. There are various kinds of reports.

Research reports are write-ups of the results of a special investigation. Reports of plans, a second type, may or may not be based immediately on information contained in research reports. In many cases plans are formulated on the basis of knowledge and experience, information from outside sources, records of previous performance, etc. Thirdly, there are operative reports which give the results of a phase of a regular activity. The results are usually in terms of quantities and qualities, and the time and resources expended in producing them. They may give an account of interferences with proper performances in which case they are control reports.

Certain characteristics common to all good reports are:

1. The information is adequate and pertinent to the purpose of the report.
2. The information is brief and concise as is consistant with reasonable completeness.
3. Information is arranged to conserve the recipient's time and facilitate his use of it.
4. Timeliness usually is a requisite.
5. The information is accurate.
6. A minimum of expense, writing, transcription, and duplication of copies.
7. The exception principle is applied in the case of executive reports.
8. The principles of good form design should be observed, particularly in the development of periodic reports.

D. RECORDS: A record is a device for the accumulation, classification, and preservation of information. Standard procedures, instructions, or reports become records when properly classified and filed.

1. The principal reasons for records are:
   - (a) The accumulation of information for use in planning and control,
   - (b) Preservation of this information,
   - (c) Reduction of human errors such as forgetfulness and emotional bias in the making of decisions, and
   - (d) Maintenance of an account of the conditions and progress of the enterprise.
2. Records may be classified on a number of bases, such as:
   - (a) Principle phases of the business.

     Sales records, accounting records, personnel records, etc.
   - (b) Characteristics of the Filing Device

     Book-type files, loose leaf records, visible index records, etc.
   - (c) Time

     Permanent, temporary, historical, or current.
   - (d) Nature of the information

     Records for purposes of creative planning, or for control.
3. Characteristics and requirements of records are:
   - (a) Sufficient reason
   - (b) The information should be used with sufficient frequency to justify regular accumulation and collection

(c) Adequate information and conveniently arranged and classified

(d) Accuracy

(e) Simplicity of design

VI. PROCEDURE AND CONTROL

It has already been stated that procedure assists control. Control is a basic process and embraces the following elements:

1. Objective - what is desired

2. Procedure

   (a) Plan - how and when it is to be done

   (b) Organization - who is responsible

   (c) Standards - what constitutes good performance

3. Appraisal - how well it was done

A control procedure may require changes in the plan of organization, additions of staff groups or committees to serve as control agencies, and numerous other adjustments. Obviously this is not a one man affair. The best talent and thinking available in the organization should be enlisted to help design the procedure of control.

Current technical and business periodicals contain many articles stressing the importance of the methods, standards, industrial engineering, or procedures (depending upon the set-up in the particular enterprise) function in modern industrial organization.

For example, S. E. Warolin of McKinsey and Co.[1] lists reports, charts, manuals, budgets and forecasts, specifications and standards, and expenditure limitations as control media and lists the following as control agencies top management can build:

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[1] S. E. Warolin, "Effective Controls for Top Management," Advanced Management Quarterly Journal, Sept., 1947, Vol. XII, No.3.

Organization planning, industrial engineering, market research, production planning, budgetary control and cost analysis, and personnel relations.

Concerning manuals he says that probably the most important medium for control is the operating manual and yet relatively few companies have done a thorough and organized job of preparing control manuals. The reason control manuals are the most effective way to control operations is that these manuals establish the policies, procedures and methods, and outline individual responsibilities far in advance of a particular contingency.

Another authority[2] presents the Operating Control Staff as operating in the fields of Policy, Organization, Procedure, and Progress, and, in regard to procedure investigation, lists these aspects:

1. Are all procedures standardized and in written form?
2. Are procedures streamlined and efficient?
3. Are procedures prescribed by higher authority complied with in all details?
4. Should any procedures be considered for change?
5. Are new procedures and changes in established routines subject to review and control?

As a final example another authority[3] lists the following elements of management to which controls are related: planned objec-

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[2] Frank L. Rowland, "Coordination - A Job for Top Management," Modern Management, October, 1946.

[3] John B. Joynt, "Management Controls," Modern Management, May, 1947.

tives, well balanced organization, sound policies and procedures, qualified personnel, adequate physical facilities, performance standards, and appraisal of results. A control check list is presented in this article and under the element of sound policies and procedures the following classification of questions is presented:

1. Policy planning
2. Procedures improvement
3. Standard practice manuals
4. Forms and Correspondence Improvement
5. Records Management
6. Employees' Suggestions
7. Work Simplification

Under procedures improvement the following questions are asked:

1. Have written procedures been developed to cover all major operations?
2. Are they well coordinated, clearly expressed and easily understood?
3. Are new methods and systems well planned and tested prior to general installation?
4. Is there a program for their continuous improvement?

VII. CONTROL OF PROCEDURE

A. STANDARDIZATION: Obviously, if procedures or methods are mainly the result of chance growth, instead of careful planning, much waste is certain to occur.

Fortunately, there is a natural tendency for procedures to become uniform as well as to become fixed. Despite the waste involved this tendency toward the development of work habits is the one thing

that makes any kind of control, however deficient, at all possible. Though all things tend to change, all things do not change at the same time.

Whenever a method has become fixed through careful, deliberate thought used in guiding and directing the formation of a habit, management is relieved of the burden of devoting constant care and attention to it. This fixation of desirable work habits, conditions, and environment is called standardization, and is essential for adequate control.

Standardization is generally carried out along with, or directly following, simplification. The two terms are sometimes loosely considered as synonymous. Simplification reduces the variety or number of items; standardization insures uniformity of the remaining items. For example, in regard to procedure, simplification would eliminate steps or reduce the difficulty in performance of some of them, while standardization would help insure compliance with the new method.

1. DEFINITION

A standard under modern scientific management may be defined as simply a carefully thought out method of performing a function, or carefully drawn specification covering an article or product. The standard method of doing anything is simply the best method that can be devised at the time the standard is drawn.

Another definition is given as: a standard represents the best current knowledge of a practice or an item to meet the necessities of current conditions.[4] The process of setting up standards is standardization.

2. REQUISITES AND PRINCIPLES

Since standard procedures are standards the requisites and prin-

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[4] "Office Standards", NOMA Bulletin No. 2, April, 1946, p. 4

ciples of standards apply equally to them. The principle of standards also should be followed in the writing up of procedures.

Following is a list of the requisites of a standard:

(1) Accuracy and precision

(2) Workability

(3) Suitability

(4) Flexibility

(5) Acceptability

Accuracy and Precision - A well formulated standard represents the thoughts and ideas of a group, not an individual. It must be accurate for if a work requirement is too high or low it will be incorrect and have little or no value. It must have a proper degree of precision, particularly in specifications for dimensions or for percentages of ingredients where a precision is controlled by specifying tolerances.

Workability - A standard may be unworkable due to something within the standard or due to outside conditions which make it inoperative. A standard may be written in a confused and inconcise manner or be too indefinite, giving rise to varying interpretations which would impair or destroy its workability and usefulness.

Suitability - Changing conditions very often make yesterday's standard unsuitable for today or a standard may be suitable in one location but unsuitable in another due to a variation in conditions in the two areas. It must be suitable where it is integrated with other standards in broad operations.

Flexibility - By making the scope of the standard as broad as possible, greater flexibility is obtained. Tolerances may be made greater without affecting the standard, thereby making it more flexible. Some standards are drawn allowing alternate methods. In some cases where correlation is possible, conversion facters will be specified. In cases where alternate methods are allowed but no correlation is possible, the specification should state that the particular method used should be stated when reporting results.

Acceptability - Standards may be adopted by one group but not acceptable by another. Reasons may be almost as varied as human nature. Management may set up standards not acceptable to the workers. The best way to gain acceptability by all groups is to have all groups represented and taking part in the formulation of the standard. In this manner broader experience and wider views are brought into play and out of these a better standard is evolved.

The following may be listed as the principles for setting up a standard:

(1) Selection - Consider what should be measured. Only those characteristics essential to give adequate control for accomplishing the purpose of the standard should be measured.

(2) Determination - Consider when it should be measured.

(a) When the volume or quantity becomes large and uniformity is desired.

(b) When repetitive operations are performed by a number of people.

(c) When quality is to be maintained.

(d) When variables need to be controlled.

3. HOW A STANDARD SHOULD BE MEASURED:

a. Observe and study the items in minute detail noting variations, outside conditions and the viewpoints of others.

b. Choose only detail necessary for the accomplishment of the desired end. Facters not affecting the item or process should be left out.

c. Determine the means for measuring the selected factors to make the standard useful. As much as possible, means for numerical measurement should be found, since measurement by empirical means always introduces judgment which in itself is variable. It is also necessary to specifically state how measurements are to be made and under what conditions, if these will have a bearing on the standard.

d. Finally, a clear, concise specification should be written giving all the salient factors, their means of measurement and conditions to be met.

4. WHAT IS ACCOMPLISHED BY STANDARDIZATION

The principle objectives of standardization are:

a. Efficiency of effort and materials.

b. Uniformity permitting interchangeability.

c. Checking costs made easier and more accurate through standard accounting.

d. Common ground for discussion of differences.

e. Control of operation.

f. Safety, health and morale.

A standard should never be considered as finished. An outmoded standard is as great a deterrent to progress as none at all. Standards must be periodically examined in view of constantly changing conditions to endeavor to improve them in line with increased knowledge.

5. APPLICATION OF STANDARDS TO OFFICE WORK

There is not and cannot be any universal standard in office work, which will be applicable under any and all conditions. Standards must be devised for particular situations; yet these can be primarily determined only when the basic principles are known.

The secondary factors governing the determination of standards are:

a. The physical conditions of location and plant.

b. The particular quality and mental attitude of personnel.

c. The particular kind of tools used.

d. The work itself.

All of these, of course, are closely interrelated. All work which can be measured as to quantity and quality can be standardized. The very fact that work can be measured proves that the variables are not a barrier to standardization, since these have been determined. There may be possible cases where it would not be economical to standardize, but that is an entirely different matter. Measurement of work by individual performance is not always necessary, though that method is preferable wherever possible. Some kinds of work must be done by groups, but the work can still be measureable though the variable human element here increases the difficulty.

Work which is not measureable either before or after performance, cannot be standardised as to quantity, but there is still an advantage in making a study of such work, with a view of partial standardization and consequent improvement, for it is easily possible that the quality of such work can be standardized at least to some extent by seeking and specifying the best methods of performance.

B. <u>THE PROBLEM OF ORGANIZATION</u>: Employment of an outside consultant, a methods staff, or the efforts of line supervisors are the three basic approaches to the improvement of office methods and procedures. Evidence shows that, of the three, an internal staff, with cooperation from employees and supervisors involved usually presents the best answer.

1. DETERMINATION OF THE SIZE OF A METHODS STAFF

One of the items under scrutiny at times when cost reductions are sought is that of overhead or expense. As volume of production falls off, there is a need of reducing overhead expense in proportion. Common practice is probably to decide that a certain per cent reduction is necessary and then to order all departments to reduce expense by this amount. However, when this is applied to the methods engineering staff, it defeats its purpose since the possibilities for securing operating economies are reduced when needed the most.

A better approach would be to estimate the possible savings that could be made by the methods engineer through a survey. The amount of man months required to effectuate the savings can also be estimated. Then on the basis of personnel obtainable, the rate at which changes can be absorbed, the number of other management problems, the optimum size of the staff can be determined. It has been said that one methods man, for a small office of twenty people, can be afforded, and on the other hand, some companies use one man for every two hundred office employees.

The exact size and type of methods organization involves so many factors that no attempt will be made here to set up an ideal methods organization with assignments of duties and responsibilities.

2. GENERAL FUNCTIONS

The objectives of a methods program are to reduce costs, improve record-keeping service, provide adequate control of operations, and secure improved working conditions.

The general functions of methods activities may be classified in the following three groups:

a. Broad management planning and organization.

b. Procedure analysis and improvement.

c. Work simplification at the level of the individual operator.

3. ARGUMENT OF THE FUNCTION OF ORGANIZATION AND PROCEDURE UNDER ONE UNIT

In a recent article,[5] William A. Gill points out the interrelationship of organization and procedures and shows that in the establishment of a management staff, it is not possible for members of the staff (individually or in groups) to work solely on organization or procedures.

The basis for his reasoning is as follows: He defines an organization as a reflection of decisions made as to the division and flow of work and authority, and a procedure as a reflection of decisions as to how work is to be performed, by whom, when and where. He then points out that in both organization and procedure the following factors must be considered, whether the analysis is to create new or existing organizations and procedures, the only difference being in the tense of the

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[5] Wm. A. Gill, "The Interrelationship of Organization and Procedures", Modern Management, November, 1948, p. 21

verb:

a. What is to be done or what is now being done.

b. When it is to be done, etc.

c. Where it is to be done, etc.

d. Who will do it or who will be concerned with or affected by it, etc.

e. How it will be done, etc.

f. Why it is necessary to do it at the time and place and in the manner in which it is to be done.

He also lists seven elements of good management which must be considered when analyzing either organization or procedures:

a. Well planned objectives which are clearly stated and understood by all concerned.

b. A plan of organization which gives ample recognition to environmental conditions and assures proper internal and external relationships.

c. Sound procedures (statements of function, regulations, orders, operational instructions, forms, records, reports, etc.) which are promulgated in writing to all concerned.

d. Personnel policies which assure the most effective utilization of the working force (executives, supervisors, and operating personnel.

e. Adequate facilities (money, manpower, equipment and supplies, space and communications).

f. Performance standards which assure the establishment of proper and comprehensive goals for quality, speed and economy.

g. Effective appraisal of results - through reports, statistical studies and audits.

On the basis of the common relationship of organization and procedure analysis with these factors and elements he concludes that each (organization or procedure analysis) may be undertaken as a project but in the analysis of either the aspects of the other must be considered, and if each is studied by an independent group organizational matters or procedure matters (or both) will suffer and inevitably the leadership of one will dominate the leadership of the other.

4. SPECIFIC FUNCTIONS

The specific functions of a methods or planning group may be stated as follows:

a. Selection and assignment of projects - careful selection of projects cannot be too highly emphasized. Careful review, and the need for improvement must be established before placing the project on schedule.

b. Survey and investigation - Define objectives. Make a preliminary analysis of the scope and block out the principal avenues of approach, then get detailed facts. Classify and analyze them to develop general principles affecting the solution of the problem. Apply knowledge and experience to these controlling factors, and develop the improvements.

c. Submission of proposals - Do not completely develop the detailed routine before submitting recommendations. If the general principles are not approved, it is unnecessary to spend time on detailed development. However, it is usually advisable to test check the more important phases before its submission.

d. Procedure instructions and installation - Develop details, write up procedures and issue them to those affected. Assist in selection and training of operators and other phases of the installation. With the supervisors of the departments affected, plan and schedule the cut-over. Care in selection of time and consideration of time will do much to implement the installation. Be on hand to meet and settle those unexpected problems which always arise. All during the installation period, it will be necessary to polish and patch up details of the procedure. Invitations are bound to arise usually because of situations that could not have been foreseen at the time of the survey, but if the plan has fundamental merit, these details can be overcome.

e. Follow-up - When the installation is running smoothly, usually in one to two months, a complete audit of the procedure should be made. All written instructions should be corrected and issued as final standard practice. Claims originally made should be compared with results and those concerned advised. In many large installations, a second follow-up check after six months is advisable. This will clear up any questions or problems that may have arisen and convince the operating supervisor that the methods man is standing behind his work.

f. Reports of progress - The methods department should make periodic reports of its accomplishments. In the case of a large project, the report should be made on a project basis. Findings to date, general conclusions and principles arrived at, next steps, etc., are all of interest to the executives in charge. Summaries of total savings on all projects, both tangible and intangible, as related to the cost of operation of the methods department will clearly indicate the value of the methods program. Projects in process may also be listed on such reports, and work done and expected results indicated briefly. While in most phases of human endeavor it is necessary to sell the value of a task, this is even more true in methods work. This selling must be of a purely factual nature, but it is of utmost importance that the facts be brought before the right people.

By far the most numerous tasks of a methods unit should consist of procedure surveys and analyses. In this area of work the greatest opportunity for savings and efficiency will be found. Elimination and simplification may be applied to the fullest.

C. SIMPLIFICATION:

1. CLASSIFICATION AND PRINCIPLES OF METHODS IMPROVEMENT

For purposes of analysis office work may be divided into two classes - routine and executive. In studying the methods of performing routine office work the following principles are suggested:

a. Performance must be standardized. To standardize this the job must be studied.

b. There should be a routine for each kind of office work whenever possible, and all office work of the same kind should go through the routine established for that kind of work.

c. This study will reveal, through time and motion studies, the best methods of manual and machine operations which must then become standardized. The best methods include the best equipment.

d. Along with the study of the best methods is the study of the best forms - best in design and number of copies prepared - which will result in the most desirable manual or machine operations; the form s must always be standardized.

e. Finally this standardization will be expressed in the form of standard practice instructions or procedures and manuals.

There are certain principles of systematizing the administrative work of a business office. These are:

a. Office work must be definitely planned and scheduled. The necessity for planning and scheduling applies to routine work such as receiving orders or answering correspondence, and to managerial work such as supervising employees, extending credit, or making decisions affecting the policy of the company. Improper or inadequate scheduling invariably causes delay which impairs the success of a concern.

b. All workers should be provided with standard procedures of what is to be done and what is expected of them. This principle applies with equal force to routine workers and to executives.

c. All scheduled work must be controlled by periodic reports. This may be called supervision. Scheduling is only the beginning. Daily, weekly, or monthly checking on the progress of the work must be part of the system for efficient work.

d. All routine work, even though standardized, must be subjected constantly to further study and analysis to check up on efficiency of present methods, forms or equipment. Business methods are not static even though standardized.

Office procedures may be classed according to their purposes.

a. Some are intended to expedite the day's business. Examples are order and billing, purchasing, production, time-keeping, etc.

b. Others are intended to facilitate the work of the second kind, by services rendered to them. Examples are mail and messenger services, filing and stenographic, etc.

While the facilitating services are rendered to all departments, each department may have its own routines and procedures which are confined within that department.

2. SIMPLIFICATION OF AN EXISTING PROCEDURE

The steps of surveys primarily directed toward work simplification are usually taken in the following order:

a. Orientation of the activity being studied with associated activities - the nature and general flow of work.

b. The distribution of forms.

c. The use and design of forms.

d. The use and design of equipment.

e. A detailed study of the individual job including the allocation of materials and supplies within the working area.

f. The layout of the office.

g. The installation of improvements.

h. Obtaining results - appraisal and control.

No fixed order of steps of analysis will cover all problems, and the degree to which each of the foregoing steps are followed will depend on the nature of the work. However, to what degree each step is utilized always divides itself into two parts, i.e., investigation and analysis.

3. OVERALL STUDY OF THE ACTIVITY

The procedure in its entirety should be studied before any detailed analysis is made of its various steps. This will enable the observer to secure a proper perspective of the work before him.

The purpose of the procedure should first be determined and just what is supposed to be accomplished by it should be thoroughly and definitely learned. This preliminary analysis should enable a determination of whether or not the purpose is justified, that is, whether the main purpose is of sufficient value to warrant the routine or procedure. It is frequently found that there is an assumption that something drastic would happen without the procedure, but after investigation, the practicality of it may become one of questionable nature.

a. Survey Method of Studying Procedures and Routines

This method makes use of a questionaire supplemented by a personal interview with the worker and the supervisor. The questionaire is called the Job Description. All departments may be studied simultaneously and the approach is based on the idea that if approached in the right manner, employees can contribute many of the facts which would only be discovered by a detailed analysis.

From this type of survey it is possible to prove (1) the department is working efficiently, (2) or that a job analysis could be profitably made, or (3) that certain changes might be desirable.

The survey, tried in a large office, gave surprising results. The employees felt for the first time that their ideas or suggestions for improvement or changes were worthy of consideration. This improved morale, and the department heads felt a greater spirit of cooperation between themselves and the workers. In addition, specific changes were made as follows:

(1) Elimination of many useless forms.

(2) Simplification of a number of forms, reducing cost of their preparation.

(3) Installation of some time-saving machines and office appliances.

(4) Standard methods of doing certain jobs.

(5) Standard and reasonable production schedules.

(6) Incentive wage-payment systems in a few departments.

Additional security was felt among employees because of the elimination of inefficiency and reduction of costs. Finally, there was a unanimous demand for repetition of the survey annually.[6]

Constructive thinking may be enhanced by means of a visible picture which will enable one to grasp quickly the main factors involved. Such a picture will show the flow of forms and information as well as present a much clearer view of the entire activity.

4. THE FLOW OF FORMS AND INFORMATION

a. The Process Chart for Visualizing Flow

Procedure investigation and analysis is greatly assisted by the use of graphic charts.

The only purpose of a graphic chart is to bring out forcibly and visibly certain leading facts. These facts in a chart should stand out

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[6] Neuner and Haynes, "Office Management and Practices", South Western Publishing Co., 1947, p. 59-67. (The actual questionaire together with a type used by the Standard Register Co. are presented).

clearly and should be simple and obvious and easily grasped by anyone. Defects or special points should be emphasized.

The chart should also be simple to prepare. A rough pencil sketch which serves the purpose it is desired to accomplish is preferable to an elaborately prepared and beautifully drawn chart which falls short in this respect. The amount of care, skill, and time devoted to the construction of the chart should be compared with and proportioned to the size and importance of the investigation. Is it worth what it costs?

Authorities have devised various types of charts and various names have been applied to the same type of chart. The process chart is probably most useful, however, in procedure investigation and improvement. Other names loosely applied to this type of chart are: work, flow, production charts, procedure diagrams, etc.

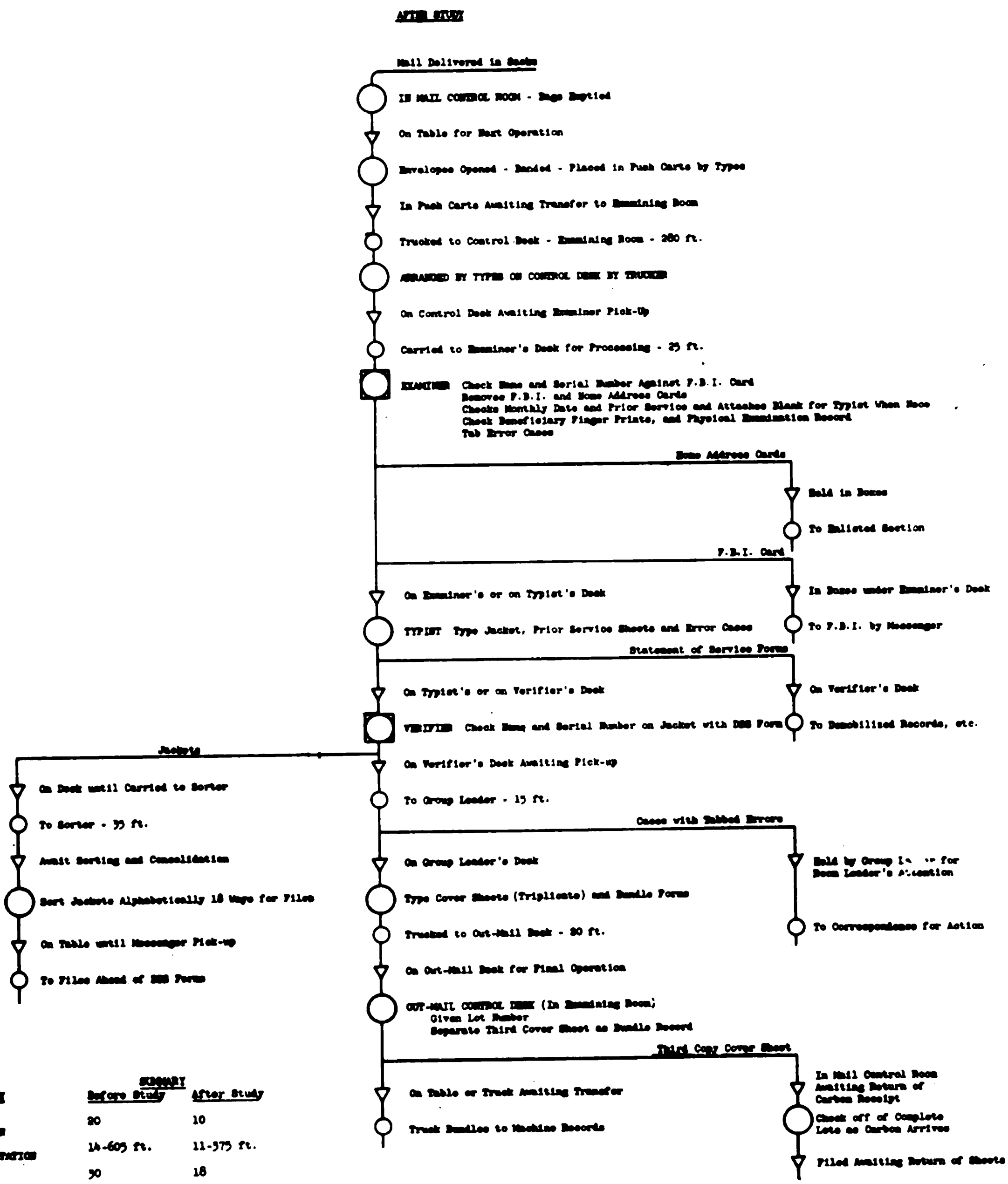
A process chart is a graphic representation of events and information pertaining thereto occurring during a series of actions or operations. It is a means of presenting graphically and in chronological order all details necessary for a systematic analysis to obtain maximum improvement, without lengthy narrative descriptions and cross-references. Symbols are employed to represent the events. Committees of technical societies have been at work attempting to standardize the types of symbols used. The minimum number of categories into which events appearing on a process chart may be classified is four - operation, transportation, storage and inspection. A fifth - delay - and sometimes a sixth - activity outside the scope of the investigation - are occasionally used, but there does not appear to be any great necessity for them in most analyses.

Although other symbols are often used, particularly for a transportation the following permit ease in recognition and are therefore

PROCESS CHART- INDUCTION PAPERS

ADJUTANT GENERAL'S OFFICE-ENLISTED BRANCH

RECORD EXAMINING SUB-SECTION



SUMMARY

KEY	Before Study	After Study
OPERATION	20	10
TRANSPORTATION	14-605 ft.	11-375 ft.
STORAGE	30	18
INSPECTION	4	2
	68 - 605 ft.	41 - 375 ft.

recommended:

◇ Operation

○ Transportation

▽ Storage

□ Inspection

An operation occurs when an object is intentionally changed in any of its characteristics, as assembled with or disassembled from another object, or is arranged or prepared for another operation, transportation, inspection, or storage. An operation also occurs when information is given or received or when planning or calculating takes place. An operation produces or accomplishes.

A transportation occurs when an object is moved from one place to another except when such movements are caused by the process or by the operator at the work station during an operation or an inspection. A transportation moves.

A storage occurs when an object is kept and protected against unauthorized removal. A storage keeps.

An inspection occurs when an object is examined for identification, verified for quantity or quality, or measured in any of its characteristics. An inspection verifies.

A template may be used in drawing the symbols.

A process chart should be headed with a title that clearly states what the procedure is and where it is performed. The date and the name of the analyst should also appear. The chart should start where the unit or units being surveyed start their first action. Care must be taken to record each action no matter how unimportant it may appear. All of the steps in the operation performed by one person should be recorded beside one operation symbol unless the operator is going through a series of operations, puts the work down and then goes through a second series. Descriptive matter is entered beside each symbol, brief but sufficient to describe the operation, transportation, storage, or inspection. Particular attention should be placed on all delays that occur. Sometimes a delay is representented by a separate symbol, but actually a delay is a storage of wasteful nature. A delay interferes.

A summary should be placed on the chart listing the total number of times that each type of event occurs, the total distance the item moves, and if time has been included, the total time for the entire procedure.

In constructing the chart, the basic flow should occupy the main vertical lines of the chart. Auxiliary or side flows should be distinct from the main flow. Occasionally it is desirable to emphasize the main flow by connecting the symbols describing it with a heavier line than is used for auxiliary flows.

When a division in the flow of work occurs, such as separate actions on different copies of a form, the division is shown by a line perpendicular to the original flow and then parallel lines each representing a form or copy are drawn off of this.

Some general points to remember when constructing process flow charts are:

(1) Most operations have a storage, sometimes temporary in nature, both preceding and following the operation.

(2) There is usually a transportation between each operation performed by separate individuals.

(3) If each of two operations is performed separately by a single clerk, there will be a storage between the operations.

Supplementary information to be recorded should include:

(1) Materials, forms, and equipment used.

(2) Distances traveled on transportation steps.

(3) Means of transportation, such as clerks, messengers, trucks, tubes, etc.

(4) Notations of any backtracking or speciál re-routings caused by errors or exceptions to the regular type of work, which cause delay and require additional time. Notations should describe the reason for the exception and the extent of its occurrence.

(5) If possible and deemed necessary the time for each step may be included with the description.

Where there is occasion to construct a chart of the flow of only one form or type of form such as an order, a check, a request, etc., and there are no copies, a chart has been devised with the flow symbols already on it, and the analyst may complete it merely by writing out the descriptions and connecting each event to its proper symbol. The symbol outline may be traced or filled in as a means of making it more easily discernible. Refer to the sample on the following page.

To make out such a process chart the following steps should be taken:

FLOW PROCESS CHART

A B C Company

PART NAME	Recommended Employment Procedure	SUMMARY	
PROCESS DESCRIPTION	Application for Employment and Notice of Acceptance Forms	FABRICATIONS	8
DEPARTMENT	Personnel	MOVES	5
PLANT	#1, Chicago, Illinois	STORES	11
REMARKS	Eliminates checking citizenship in three sections	INSPECTS	1
RECORDED BY	C. J. Johnson DATE 4-17-49	TOTAL STEPS	25

STEP	FABRICATION	MOVE	STORE OR CHANGE CARRIER	INSPECT	DESCRIPTION OF Proposed METHOD	Section	Distance Feet	Approx. Time Hrs.
1			1		Form 57 in "in" box	Register		
2	1				Lists in Register	"		.010
3	2				Assigns to proper rater	"		.030
4			2		"Out" box	"		
5		1			Forms 57 by messenger	Qualifications	50	
6			3		"In" box	"		
7	3				Rates qualifications	"		.025
8	4				Assigns requisition number	"		.010
9			4		"Out" box	"		
10		2			Forms 57 by messenger	"	35	
11			5		"In" box	Investigations		
12				1	Checks citizenship	"		.100
13	5				Notes any previous record	"		.06
14			6		"Out" box	"		
15		3			Forms 57 by messenger	"	20	
16			7		"In" box	Clearance		
17	6				Obtains C.S.C. clearance	"		.07
18			8		"Out" box	"		
19		4			Forms 57 by messenger	"	40	
20			9		"In" box	Certification		

STEP	FABRICATION	MOVE	STORE OR CHANGE CARRIER	INSPECT	DESCRIPTION	Section	Distance Feet	Approx. Time Hrs.
21					Types notice of appointment	Certification		.055
22					Forms 57 and notices of appointment by clerk	"	35	
23					"In" box	Employment		
24					Dispatches notice of appointment	"		.010
25					Files case	"		

(1) Decide on the symbol that best describes the first step in the procedure. Inside the symbol place a number one (1). (Note: each type of symbol is numbered consecutively).

(2) In the description column, enter sufficient information to indicate what is being done. However, do not repeat the word indicated by the symbol.

(3) Fill in the information desired in the right hand columns (time, distance, equipment, etc. as necessary).

(4) Repeat the above steps to the end of the procedure and connect successive symbols.

(5) Summarize each column and enter the results in the summary on the right of the heading.

If the process is new or a revision of an old method the process chart may also be used, but the operations should first be planned in the light of the objective having sufficient space to fill in the necessary transportations, storages, and inspections later.

Some process chart forms are provided with two sets of columns, one for the present method and the second for the new or revised method. This facilitates comparison of the two procedures.

A particular application of the printed form is for a process chart where a person instead of a form or record is to be followed through a series of operations. Service work, and much of the work of supervisors and executives can be reduced to charts of this type.

Usually the portraying of an office procedure, however, involves the charting of several clerical operations that are performed on a number of related forms. For this reason the chart will be of the first type, that is, especially designed for each situation, and printed chart forms cannot be used except in limited cases.

The use of symbols has been carried to a higher degree than the basic four as described above. On the following page is a chart showing symbols used in several government offices. These were developed by Piacitelli.

The advantages of the process charts so far described are their simplicity and the ease with which they may be followed and understood. They answer the questions (1) what action is taken? (2) how is the action initiated? and (3) when does it take place? However, if a system or procedure is to function properly two other questions must be answered: (4) who takes action? and (5) where does it take place? A chart more difficult to follow but helpful in answering these questions may be used by placing the steps chronologically under a series of columns headed by the persons or departments performing the work. The chart can be made up for either an interdepartmental system or procedure or an intradepartmental procedure, but both should not be incorporated into one chart. The description of each step may be placed next to its symbol or in a separate column at the side but horizontally opposite the symbol. The latter method is preferable. Refer to the illustration on the following page.

The symbols used for this type of chart are slightly different than those already illustrated. Since each line will indicate a transportation between individuals or departments no symbol for this action is necessary. Hence a solid line denotes the path of travel that a form or information will take. A different line is used to represent each form, copy, or information, and each line should be labeled to

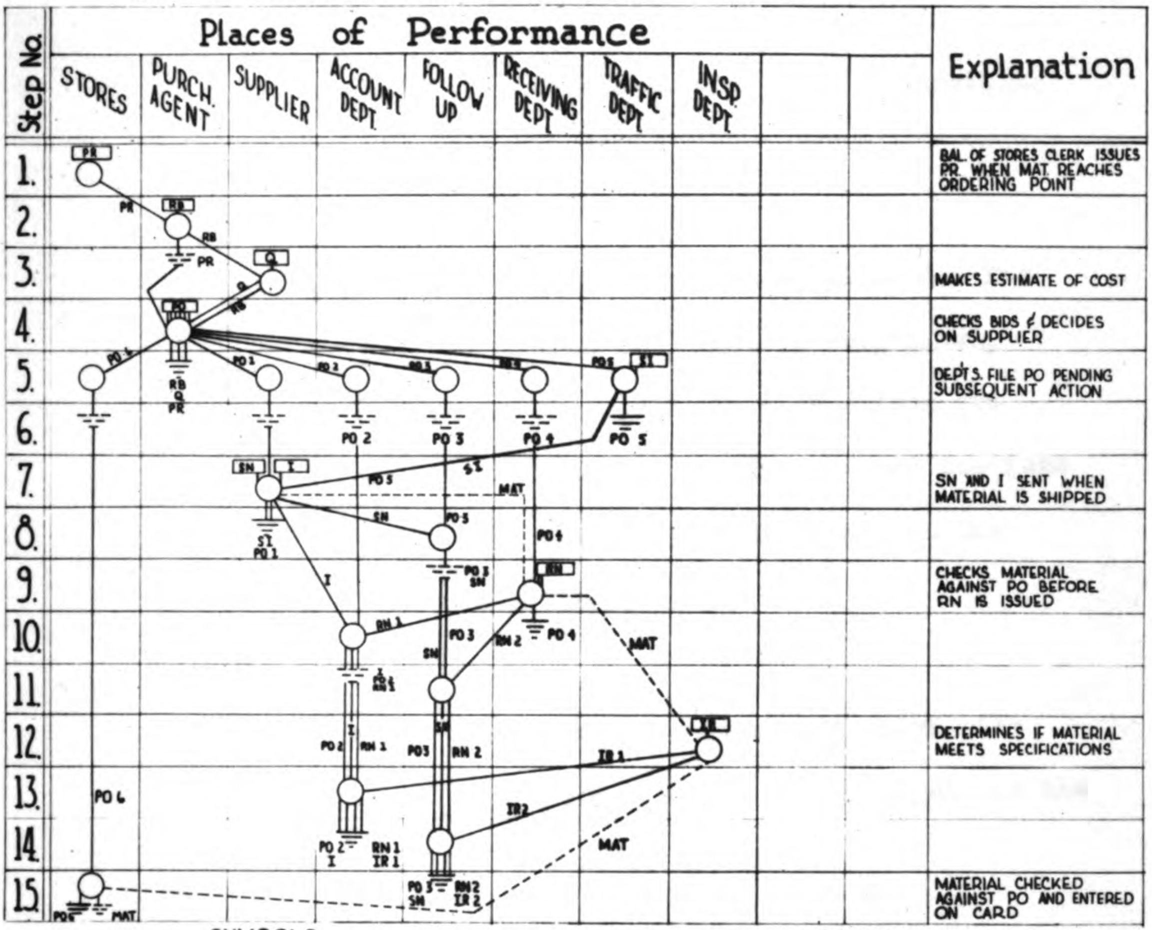
PROCEDURE CHART SYMBOLS FOR OFFICE OPERATIONS

- Transmittal
- Send by Messenger
- Deliver personally
- Miscellaneous operation for which there is no specific symbol
- Subsequent operations on indicated documents or process not necessary to the particular chart
- Fill in form
- Prepare letter, report, etc.
- A subsequent return to the flow of indicated documents from a unit whose particular operations are not important to the instant chart.
- Sign letter memo, etc.
- Type
- Voucher preparation
- Time stamp. (Also indicates date stamp).
- Numbered, stamped, etc.

- Perforation, such as: cancellation of a security of coupon: or affixing dates
- Posting in ledger, journal, etc. (By hand)
- Posting in ledger journal, etc. (By machine)
- Record in diary
- Sort
- Assemble
- Destroyed
- Distribute to two or more people
- Confer - two or more people working together
- Note and sign (Surname)
- Transmit information by telephone.
- Search of temporary file
- Search of permanent file.

- Received
- Receive information by telephone
- File temporarily
- File permanently
- Check for quantity
- Check for quality
- Check for both quantity and quality (Examine)
- Inspect for quantity and perform operation
- Inspect for quality and perform operation (Select check, and make entry).
- Approve (Administrator's or Division Head's perfunctory Signature Actual, official final approval by any one).
- Extension proof or other mechanical check of an arithmetic operation.
- Document, form or other paper. For example. $\boxed{\frac{1}{3}\text{FI-149}}$ means original and three copies of form FI-149
- Discontinuity; intervening functions unimportant to the chart.

Title · *PURCHASING ROUTINE OF THE ABC MANUFACTURING CO.* Observer · *JOE JONES* Date *10/19/44*



SYMBOLS

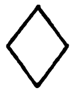
- ACTION TAKEN
- FORM ORIGINATED
- PERMANENT FILE
- TEMPORARY FILE
- FORM DESTROYED

LEGEND

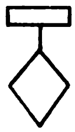
PR	PURCHASE REQUISITION	SI	SHIPPING INSTRUCTIONS
RB	REQUISITION BID	SN	SHIPPING NOTICE
Q	QUOTATION	I	INVOICE
PO	PURCHASE ORDER	RN	RECEIVING NOTICE
MAT	MATERIAL	IR	INSPECTION REPORT

indicate which form it represents. A key is provided to denote the form that the abbreviations represent. A broken line may be used to denote an optional path (the path a form may occasionally take).

Following are recommended as symbols to be used:



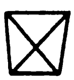
denotes action taken. Something is done.



denotes a form originated. For each copy that is originated, there will be a line from the block to the diamond and the form abbreviation is placed in the block.

denotes a permanent file: the form will not be used again in the process cycle.

denotes a temporary file.



denotes form destroyed.

Numbers are placed after the symbols in the key at the bottom of the chart giving the total number of forms originated, the number destroyed, the number permanently filed, and those temporarily filed.

Thus, by means of this chart, one's duties in a system or procedure can be immediately perceived.

To make this type of chart certain rules should be followed in tracing a procedure.

(1) Title, observer's name, and date entered in the heading as before.

(2) Determine the party or the department where the first action is taken.

(3) Enter the title of the position or name of the department in the heading at the top left side of the columns, and place the proper symbol (usually form originated) in the top square of the first column.

(4) Follow the form that initiates action with a line or lines, indicating path of travel, to the next column and the second square from the top and repeat rule 3.

(5) Follow each form that is originated and send it to a new step if action is taken. If it is filed in the same department, the path of travel may send it to the next step in the same column. There should never be more than one action taken or form originated in one step, but there may be any number of files or destroys in one step. The reason for this is that since it is necessary to explain each action taken and form originated, it is impossible to place more than one in each step. The files and destroys are not explained, and hence can be entered on any step.

(6) If a form is held for future reference a temporary file symbol should be used, and when the form is used again, the

path of travel should take the form out of temporary file to the proper step where it is used.

(7) Place the abbreviated name of the form on each path of travel line. At the same time enter the abbreviation of the form in the key at the bottom of the page with its identification name. If three or four copies of one form are made, each copy can be identified by use of a sub-number. An example of this might be:

PRR_1 - Original copy of a Piece Rate Request

PRR_2 - Duplicate copy

(8) In the explanation column to the right, the details of the action taken or form originated may be explained. It is important not to repeat those things that the chart portrays. The explanation column is a what and why column; the where and who are shown on the chart.

(9) The step column, on the left is used to identify each step by a number in sequence.

(10) A time column, at the extreme right may be used to indicate the approximate time required to make out the required form and deliver it to the next place of performance. (If several copies are made out put down the time for the copy taking longest to deliver).

(11) After the chart is completed, total the number for each symbol and enter it under the total column at the bottom of the form.

(12) Several points may be listed as a means of checking the chart:

(a) Each form must be originated.

(b) Places of performance should not be repeated.

(c) Places of performance should not contain both departments and sections of departments.

(d) Each form must have a final resting place, i.e., must be either permanently filed or destroyed.

(e) Each form and each copy should have a separate line indicating its flow.

(f) Each flow line should be marked to indicate what form is used.

(g) The number of lines entering a place of action or a temporary file should equal the number of lines leaving the place of action or temporary file.

(h) No two places of action should occur at the same step.

(i) The chart is read from top to bottom, i.e., there should be no flow upward.

(j) The total of permanent files and forms destroyed should equal the number of forms originated.

The point of checking a process chart cannot be overemphasized. The check establishes the validity of the original job. If errors are left uncorrected, all subsequent work based on the original becomes inaccurate and useless.

When making out a chart, there is ample opportunity for inaccuracies to creep in, but if the factors which may cause errors are recognized a more effective job may be done, not only in catching errors, but also in preventing them while the chart is being constructed. The following is essential:

(1) Complete familiarity with the chart to be used; the meanings of symbols, and rules governing the procedure for making the chart.

(2) All detailed information regarding the procedure must be at hand. This is frequently a difficult job, and there is much chance for the inclusion and acceptance of faulty information due to variations in interpretations.

(3) All the data must be organized so that it can be readily included in the chart. In an involved procedure, the maintenance of proper relation between forms, the sequence of entries, and the flow of the various copies becomes difficult.

(4) In making the chart, it may be necessary to make changes as data originally intended for inclusion was omitted. When changes are made, care must be taken to insure that complete influence of the change is noted.

The points indicate only generally the manner in which errors may originate. There are other causes depending upon the procedure recorded and conditions surrounding the job. The method of checking the accuracy of the chart must be thorough, but easy to make. Any part of the procedure which has been omitted or any part which has not been properly shown must be discovered.

A check sheet consisting of a series of questions such as "Is there an origin for each form?" or "Is there one flow line for each form?" will serve to indicate areas to be checked. By this means it is easy to make a thorough check quickly.

b. Analysis for Improvement

After a thorough investigation of the existing procedure has been made and it is completely understood, the charts and data must be analyzed for improvements. The method usually advocated is the same as used in checking the soundness of a chart. That is, as an analysis tool the chart may be supplemented with a check sheet consisting of a series of questions to be applied to each step of the procedure. These two together will aid the analyst in determining the need for each form used in the procedure, the purpose of each entry, and the general soundness and practicability of the entire procedure.

The most common questionnaire consists of six questions to be asked of the process as a whole and each operation and inspection in the procedure:

Why - must it be done? Is the work essential? Can it be eliminated? This is the most important question of the series and must not be passed over hurriedly.

What - makes the work necessary? Could previous processes and operations or regulations and directives be changed to eliminate the necessity of the work - or reduce the amount of it?

When - could it be done more economically? Should the sequence of steps be changed?

Where - could it be done more economically? Should it be combined with work done elsewhere or should part of the operation be separated? Where else is the work being done? Check for duplications that can be eliminated.

Who - is the proper type of person for the job or the proper office, branch, department, etc. to perform the operation or step? Are employees of the proper skill and temperament being selected for the job? Could a change be made in the work to permit using a lower skill? Are skilled individuals being wasted on unskilled work for a large proportion of their time?

<u>How</u> - should the work be done? Can equipment or method be improved? Does the work-place lay-out provide for a minimum of effort? Can mechanical equipment be profitably utilized to reduce manual labor?

The questions must be asked searchingly and repeatedly. A satisfactory answer or defense against each question must be obtained otherwise there is indication that improvements can be effected. Remember that to those answering these questions the "present way" is likely to appear "natural" and "best".

After carefully reviewing the existing procedure, by means of the foregoing six questions, and recording possible changes, the following list of check points can be used as possible leads to further improvement:

(1) Can the time required for each operation be reduced by combining it with some other part of the system? By separating it?

(a) Avoid combining high and low skilled jobs unless the advantages through elimination of transportation and storages will affect the loss due to overpayment to the skilled employee during that part of his time when he will be performing the low skill part of the activities.

(b) Do not increase responsibility to such an extent that quality of the work will be affected.

(c) Consider the effect of combinations on training period.

(d) It is advantageous to blend combined operations into a single operation rather than as a sequence of two operations. This is not always possible.

(2) Can storage locations be moved advantageously?

(3) Can storages be eliminated? Often more of the overall time is occupied by storages than by actual operations. If speed of processing is important, these must be studied.

(4) Inspection as a separate activity should be questioned as to the desirability of combining it with some other activity.

(5) Can transportation be eliminated, shortened or expedited?

(a) Will a rearrangement of layout or sequence of operations eliminate the necessity for moving the work?

(b) Can transportation distances be reduced?

(c) Can backtracking be eliminated or reduced? There should be a direct movement over the minimum distance.

(6) How can interruptions be avoided?

(7) What are the causes of exceptions to the general flow of work? How can they be reduced? Should they be handled differently?

(8) Are there certain operations or steps delaying the completion of the process through bottlenecks? How can these be eliminated?

(9) The analysis will sometimes indicate duplications of work.

(10) Can equipment be improved?

5. USE AND DESIGN OF FORMS

A form is a standardized record used for efficient accumulation and transmission of information.

a. Forms may be Classified as:

(1) External forms - those sent outside of the company.

(2) Internal forms - those used or received by employees.

(a) Memorandum - to request or instruct

(b) Records - to store information for further use.

(c) Reports - to simplify accumulated data.

Forms are also single or multiple, that is, of one or more than one copy.

Good forms expedite office work and fix responsibility where written evidence is required. They should simplify methods and improve procedures, thus saving time and preventing errors. They also reduce costs by reducing the amount of writing. The use of forms, however, can become unwieldy and burdensome. It is said that 68% of clerical work is used in handling forms.

b. The basic principles involved in forms control may be listed as:

(1) Forms must be standardized and the standard adhered to.

(2) All forms should be reviewed periodically.

(3) There must be authority for form design according to the standards and requirements of the forms.

(4) The authority must be a contributor, and not a censor.

c. Actually there are two primary factors governing the problem of forms:

(1) Purpose - Generally a form is used to make clerical work easier than if a blank sheet of paper were used, but beyond this each form has a special purpose and examination must be made to determine just how much of this purpose is achieved.

(2) Use - This will determine the method of design and the

characteristics. For example, whether the form is to be typed or written out will require differences in design.

d. Standardization

The standardization of forms is concerned primarily with the physical characteristics - size, quality of paper, ink, color, type styles, punching and padding.

Form size is usually the first factor to consider. Tables of standard form sizes have been prepared by numerous paper manufacturers and distributors, and by several authors of textbooks.

Paper requirements are usually considered through the analysis of four main factors:

(1) Degree of permanency of record: longivity.

(2) Amount of handling, exposure, folding, treatment, etc.

(3) Method of applying the ink.

(4) Appearance or appeal of the paper.

Considerable data is also available on the quality or grades of paper available to fit these needs.

Type faces should be simple; generally Gothic faces are preferable. The number of different sizes and types should be kept to a minimum. Bold type should be used where emphasis is essential. The same type face should be used for all items of equal importance.

e. Design of Forms

The primary question in reviewing any form is "Why is it necessary?" If the purpose is obtained, the next step is to determine the information required and the easiest source for obtaining the necessary data. The final step is to design the form so that it can be prepared with a minimum of effort, and after completion can be used most effectively.

The filling out and use of the form is often placed in secondary consideration to the physical specifications as given above. The average form costs less than one cent a copy but when the value of the labor and overhead involved in completing a form is included, it is always at least ten times the cost of the actual form. There is no one "best" way, but the following considerations will assist in good design:

(1) Title - Clear and descriptive, giving the purpose and a simple means of identification.

(2) Information required clearly indicated - brief but with words and abbreviations chosen carefully.

(3) Eliminate unnecessary data.

(4) Instructions - should be brief if they are necessary at all, and subject to only one interpretation.

(5) Form numbers - should be assigned according to a definite system for positive identification.

(6) Proportion spaces for entering data properly.

(7) Consider the possibility of combining a form with or completing it in conjunction with another form.

(8) Consider the effect on other forms with creation or revision of a form.

(9) Identification - if detached from a file of related papers.

(10) Identification - in the most conspicuous position, if a revision, indicate the revision date.

(11) Consider "box design" - where the information is placed in a box on the form.

(12) Ballot type entries - speeds completion and insures definite

answers.

(13) Headings - should be located above, not below, the blank for visibility while typewriting.

(14) Machine specifications - consider requirements for use in the machine. If the form is to be filled in on a typewriter, observe the following:

(a) Start as many lines as possible from a common left hand margin point.

(b) Where typing of several blocks must be carried across the form, arrange printed matter to permit common starting points to enable use of tab key, or, arrange starting points close enough so that spacing can be done with a few strokes of the space bar.

(c) Observe vertical typewriter spacing in lining (ruling) the form so that the carriage return lever may be utilized to advantage and it will not be necessary to adjust the roll to each line.

(15) Tumble design - use when filed with papers fastened at the top so that the back side can be read by turning the page.

(16) Consider space for fastening or pasting - so that no information is covered.

(17) Colored paper - use light shades and use only when it increases the efficiency of the operation.

(18) Consider size to agree with envelope sizes - if form is to be mailed. Use window envelopes wherever possible.

(19) Use a continuous form - if it can be used to advantage such as when using a typewriter, when many forms of the same type

are to be made and carbon copies are necessary. This saves time in inserting carbons and placing the form in the typewriter.

(20) Arrange information in the best possible sequence. Important points should be given emphasis. Related data should be grouped together. Normally, the person entering the information should be given first consideration when arranging the sequence. However, if time of the individual analyzing the form is of importance, he should be given preference.

(21) Arrange data on the form in the order in which it is copied or posted. The forms from which information is to be taken should be so considered. When forms are used for posting or copying, informations should be arranged in identical order, if possible, on both forms to facilitate this process.

(22) Usually it is preferable not to use both sides of a form for entering information - the reverse side can often be used to carry detailed standard instructions.

(23) Consider the type of person who will fill in the form. Design should be such as to eliminate possible error. Forms filled in by unskilled persons require more instructions.

When the design is complete, develop instructions to cover the use of the form.

As a final step, have it approved by the proper authorities and check it with the people who will use it. When it is to be initialed, be certain that all parties who will receive the form or parts of it receive due notice. This should usually be in the form of a directive.

Various questionaires or check sheets have been designed to assist

in making forms surveys. The use of these simplifies and standardizes the method of form control.

It can readily be seen that the problem of form control is important in the analysis of procedure.

6. THE USE AND DESIGN OF EQUIPMENT[7]

This subject envolves the knowledge of the types and uses of supplies, furniture, material handling, communications, and also of plant and office layout, and individual working area layout.

In the consideration of facilities to assist in the individual operations principally manual in nature, operation analysis should precede the consideration of the equipment and supplies. However, so much equipment that will affect the whole procedure or even the system is available, that a study of this should usually precede an analysis of the individual operation.

a. Machines and Appliances

In the selection of machines the following principles should be realized:

(1) Use only when they will reduce the actual cost of doing work.

(2) Install a machine if its cost can be realized in one or two years. This principle is given since the equipment involved in procedures and systems usually becomes obsolete very rapidly and its use abondoned.

(3) Use machinery where the nature of the work is repetitive and monotonous.

(4) Where accuracy is important, machines may be used and advan-

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7 This topic is so very broad that only generalizations can be made here.

tage may be taken through mechanical and automatic checks.

(5) Where time is of utmost importance, machines are often profitable.

(6) Standardization of makes of machines is wise because of the ease in training of operators, measuring out-put, uniform work and reduction of cost in maintenance.

A general classification of machines in common use in procedures is:

(1) Writing and Reproducing machines
   (a) Typewriters and billing and bookkeeping machines
   (b) Dictating and transcribing machines
   (c) Duplicating or reproducing processes
   (d) Check writing, signing and endorsing machines
   (e) Addressing machines
   (f) Numbering, dating, receipting and canceling devices.
(2) Computing machines
   (a) Adding and subtracting
   (b) Registering machines
   (c) Calculating, multiplying and dividing machines
(3) Classifying and selecting machines
(4) Mail handling machines
(5) Intercommunication systems
(6) Time and quantity machines
(7) Paper processing machines

Of these, the installation of classifying and selecting machines such as those built by the International Business Machines (IBM) Company, and the Remington Rand Company will have a great effect on the systems and procedures of any industrial enterprise in existence today. However, their use is generally limited to large volumes of work. Their influence is greatest in accounting and production control systems through the use of punched card forms and records. These companies have published considerable data on the procedures for the use of punched cards in these systems.

In the selection of particular makes of machines certain factors should be considered since not all machines will accomplish results with the same degree of efficiency even though the same results may be obtained.

Among these are:

(1) Speed of the operation.

(2) Simplicity - means easier to operate and maintain.

(3) Flexibility - where the volume of work of one type is somewhat limited, but the machine may be adapted to other types as well. Specialized equipment is preferred where volume is warranted.

(4) Portability - if a frequent change in location of the machine is desirable.

(5) Time required to train the operator.

(6) Adaptability - the ease with which it can be adapted to a present system or procedure. The application of a machine may require the complete rearrangement of the forms and records involved in a system. In order to avoid the operation of two parallel systems for an extended period, extensive copying of records to new forms may become necessary and costly. Consideration must be given to the effect on

other procedures. Personnel must be retrained.

(7) Maintenance service - avoid foreign makes.

(8) Operating cost - including supplies, space, special equipment, forms, repairs, power, etc.

(9) Cost of machine - often overemphasized.

b. Supplies

Supplies such as fasteners, chemicals, paper and other materials used will influence the procedure.

c. Furniture

In many cases the design of furniture should be considered during the analysis of the individual operation, but for standardization of furniture the entire procedure must be analyzed. In the design of furniture, consideration must be given to the available area and the location. Available filing and storage cases and methods must be considered also.

d. Material Handling Equipment

The use of conveyors, trucks and pneumatic tubes must be considered. This is also an important consideration in the layout of the plant and office.

7. DETAILED STUDY OF THE INDIVIDUAL JOB[8]

When it is desired to analyze for additional improvement, a portion of work which would appear on a process chart such as an operation, an inspection or a transportation, the operation chart can be used. An Operation Chart is a method of recording the individual motions simultaneously made by each hand while performing a task.

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[8] This and the information on layout and follow-up is adapted from the "Manual for Control Officers", Volume III, prepared by the Control Division Headquarters, Services of Supply - U.S. Army, 1942.

a. Operation Charts

There are a number of types of operation charts and various methods are used to express the body motions. The type used depends largely on the degree of detail with which the analysis is made. A type which suffices for most analyses consists of a simple statement of what is done by each hand. The left hand column is used for the movements of the left hand and the right for the right hand. Wording is brief and operations or movements which occur at the same time are entered opposite each other. A sample chart is shown on the following page.

After preparing an operation chart covering the existing method, it may be analyzed for possible improvement through consideration of the following:

(1) Will a rearrangement improve the motion paths?

(2) Where do ineffective or unnecessary motions occur?

(3) Are any unnecessary delays present? Can they be eliminated by:

(a) A rearrangement of motion sequence.

(b) A change in type of motion so that a more simplified motion is used, using less of the body or parts of the body.

(c) A better synchronization of work members.

(d) Introduction of some other work.

(4) Is the distance traveled at a minimum?

(5) Can the number of times a hand moves empty be reduced by:

(a) A rearrangement of the order of motions.

(b) Better arrangement of equipment.

(c) Use of drop delivery, slipping bins, or a circular work place.

Michigan State College
Mechanical Engineering Department

ACT CHART

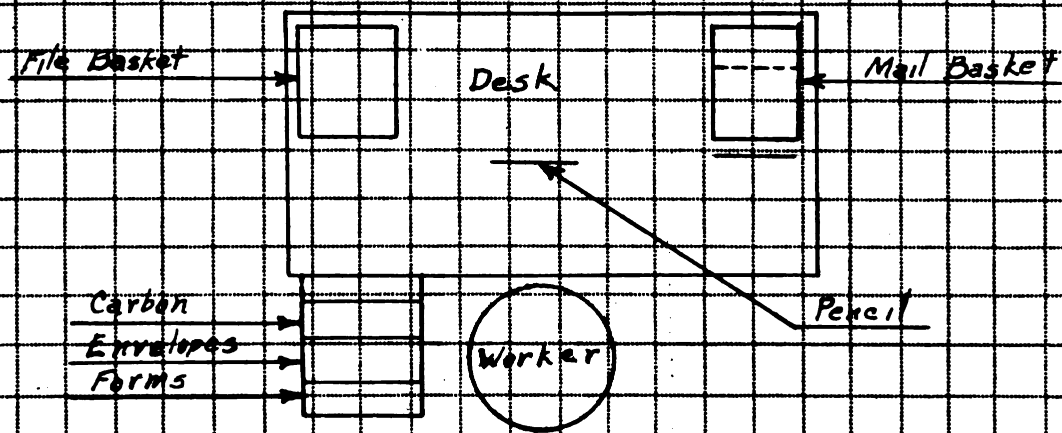
PART NAME ---- PART NO. All

OPERATION NAME Completing and Mailing Duplicate Form OPER. NO. Any

DATE 5-4-49 DEPT. M.E. OBSERVER C.J.J.

STANDARD TIME **** YEARLY PROD. ****

WORK PLACE LAYOUT



All objects used are stored at worker's desk.

STEP	LEFT SIDE EXPLANATION	OBJECT	ACT	Eye Focus	ACT	OBJECT	RIGHT SIDE EXPLANATION
1	From drawer	2 forms	Get	drawer	Get	1 carbon	From drawer
2	On desk	1 form	Place		Wait	carbon	Hold
3	Hold other	"	Wait	carbon	Place	"	On form
4	On carbon	"	Place	form	Place	form	Help left hand
5	Forms and carbon	Pack	Hold		Get	pencil	From desk.
6	Forms and carbon	Pack	Hold	form	Place	pencil	On form (fill out)
7	Fold ½ vert.(orig.)	Form	Get	form	Hold	pencil	Help left hand
8	From drawer	Envelope	Get	envel.	Wait		Hold form & envelope
9	Envelope on desk	Edge	Place	envel.	Wait		" " "
10		"	Hold	envel.	Place	form	In envelope (hold pen)
11	On desk	Envel.	Place		Wait		
12		"	Hold	envel.	Place	pencil	On envelope (address)

IE - 3

(over)

STEP	LEFT SIDE			Eye Focus	RIGHT SIDE		
	EXPLANATION	OBJECT	ACT		ACT	OBJECT	EXPLANATION
13	**In mail basket**	**Envel.**	**Place**		**Place**	**pencil**	**On desk**
14	**From desk**	**carbon**	**Get**	**desk**	**Get**	**form**	**Duplicate**
15	**In drawer**	**carbon**	**Place**	**drawer**	**Place**	**form**	**In file basket**
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

REMARKS

(6) Can guides or stops be used to reduce hesitation in finding or disposing articles?

(7) Can a fixture be used to eliminate holding an object in the hand during a routine?

(8) Is the work confined as much as possible to the "normal" work area; that is, within the area covered by the hands when the arm is extended from the elbow? When part of the work must be outside the normal area, it is confined within the "maximum area"; that is, within reach when the arm is extended from the shoulder without bending or twisting?

(9) Can the operation be performed two at a time - one by each hand?

(10) Are the motion paths easy to learn?

(11) Are the motions made along the natural paths of the members involved?

(12) Is it practical to combine some movements so that two or more are done simultaneously?

b. The following principles of motion economy should be observed in developing an improved Operation Chart:

(1) Both hands should preferably begin their movements simultaneously.

(2) Both hands should preferably complete their movements at the same instant.

(3) Both hands should not be idle at the same instant, except during rest periods.

(4) Motions of the arms should be in opposite and symetrical direction and should be made simultaneously.

(5) Hesitation should be studied and, if possible, its cause eliminated.

(6) Hand motions should be as simple as possible. This will provide the fastest motions. The fewer body members that are used the faster the motion. The classifications in order of economy are:

(a) Finger motions only

(b) Finger and wrist motions

(c) Finger, wrist and forearm motions

(d) Finger, wrist, forearm and upper arm motions

(e) Finger, wrist, forearm, upper arm and body motions

(Note: The last class requires a change in position while the first four do not).

(7) Material and equipment should be located as nearly as possible within the normal grasp area.

(8) Sliding, rather than carrying is usually quicker to transport small objects.

(9) Every instance where delay occurs suggests the advisability of providing some optional work which will permit the utilization of the time of delay.

(10) Straight-line motions requiring sudden changes in direction are not as desirable as continuous curved motions.

(11) The sequence of motions should be so arranged that they increase the possibility of rhythm and can become automatic.

(12) Work equipment and materials should be put in place before work begins; their position should be settled to reduce the operations of searching, finding and selecting.

Detailed job analysis with the use of operation charts will probably not be warranted unless the work is highly repetitive and similar operations are performed by a number of people. Simple jobs such as form typing (i.e., filling in of some form continuously) and operation of standard machines such as typewriters, adding machines and tabulating equipment lend themselves readily to this type of analysis.

When the job is complex it is sometimes advisable to study the simpler parts of the operation and improve these. For instance, all jobs involving typing could be studied from the point of location of materials and assembly of paper, insertion in the machine, removal, etc.

Operation Charts can often be used to facilitate the training of an employee in the proper way to do his job. When the revised method is determined the instructor and the employee on the job can be taught the simplified sequence of motions and the proper timing by direct reference to the charts.

It has been stated that the two work areas commonly used in layout of desk equipment are: (1) the normal area is that whose limits are covered by an arc made by the hands when the arm is extended from the elbow, and (2) the maximum area is that area within reach when the arm is extended from the shoulder without bending.

When forms are located on a desk, frequency of use should decide where the forms will be placed. Those forms which are used very frequently should be located within the normal work area. Forms used fairly frequently should be located within the maximum work area. Forms or materials seldom used may be located off the work surface in drawers if necessary.

When supplies such as paper clips are used frequently, they can be located near the normal area or a small quantity can be removed from a reservoir supply and placed directly on the surface of the table within the normal area.

Disposal trays should be built with two sides to act as a guide and stop to locate the papers and keep them from falling off the desk. The two open sides face the operator. This type of equipment facilitates disposal of forms. Where volume warrants, disposal bins may be sunk into the table top or attached to the side of the table.

The following is a check list of factors to be kept in mind in changing equipment or placing the materials on the work area:

(1) Tools and materials should have predetermined locations.

(2) Location should be such as to permit the best sequence of motions.

(3) Good illumination should be provided.

(4) A chair of a type to assure good posture should be provided.

(5) The principles of motion economy should be observed.

8. LAYOUT

a. Advantages of Proper Office Layout

The objectives of office layout study are:

(1) To obtain a straight-line flow of work which will insure a minimum of criss-crossing of items in process.

(2) To conserve space while providing enouch room for each individual and section to operate efficiently without being cramped.

(3) To reduce the time necessary to do a section's work.

(4) To provide working conditions that will increase personal efficiency and reduce office strain and fatigue.

(5) To plan for expansion so that interim moved may be reduced to a minimum.

In procedures improvement, layout planning principles must be applied to present quarters as well as when a move is contemplated. Moving to new quarters should always be taken as an opportunity to improve a poor layout. However, moves at other times can be profitable when existing layouts require backtracking, congested areas, etc.

b. Layout Chart

A simple layout chart can be used to determine if the layout can be improved. On a scale drawing of the office, draw lines between desks, etc., to show the flow of work through the office. If, on inspection of the completed chart, considerable criss-crossing and long distance hauls are noticed, a rearrangement may be profitable.

Once the need for a new layout has been established the ideas and suggestions of employees should be solicited and discussed.

The total amount of floor space available must next be allotted among the various operating units.

In allotting and locating these units, the following points should be observed:

(1) Be sure that the work of each unit flows continually forward within itself.

(2) Place units that compliment or work with each other in adjacent quarters.

(3) Locate supervisory officers near the units which they control.

(4) Place offices that are visited by the public near the entrance.

(5) Minimize the number of private offices and partitions since

these not only make clerical supervision difficult but also tend to interfere with lighting, heating, ventilation and the flow of work. Private offices should be assigned only when quiet is essential or conferences are required. A conference room, available for all who may need it, is often adopted. This allows the supervisory personnel to be located in the open office space.

(6) Use the best lighted portions of the office for locations of clerical activities or those requiring close and constant visual work. Areas away from windows should be used for aisles, files, etc.

(7) When possible, segregate movement or noise producing actions from personnel doing mental work.

(8) Locate near ramps or elevators those units which will make the greatest use of these facilities.

Draw a plan of the space to scale. This will be a floor plan showing all doors, windows, columns, telephone and electrical outlets. It should be drawn to a scale of 1/8 or 1/4 inch to a foot depending on the size of the office under consideration. Paper ruled in quarter inch squares can be used.

An outline, to the same scale as the floor plan, should be made of each piece of furniture or equipment used. These templets can either be home-made or purchased. When made by hand, they should be cut from light cardboard of a color that will contrast well with the basic floor plan, to assist not only in visualizing the layout during trial location of the templets, but to provide contrast should it be desirable to photostat the finished plan.

Blue is not satisfactory for photostating.

c. Considering Expansion and the Future

If it is contemplated that expansion will be necessary in the near future, space should be provided for the additional equipment and personnel. Templets of two colors, one representing current equipment and another future equipment, can be tacked into place on the master floor plan. The templets of future furniture or files should be so indicated.

d. Checking the Ideal Layout

When the templets have been shifted about to what appears to be the best office layout, a check should be made to see if the flow of work is as straight as possible. This can be done in either of the following methods:

(1) Chart the flow of main work with pencil or thread. Next, select the supplementary functions of the unit and follow the same routine using a different colored thread for each. When completed, inspection will aid in deciding whether the layout can be improved.

(2) Planning rearrangements or moves - the day of the rearrangement should be planned far enough ahead to enable proper scheduling and closing of current operations. Time and inconveniences of moving can be minimized by planning the move for a week-end or holiday.

D. INSTALLING IMPROVEMENTS

Once the possibilities for improvements have been determined, immediate steps should be taken for their installation. The following steps are usually desirable, in the order mentioned:

1. Presentation
2. Discussion
3. Conclusion
4. Orders
5. Follow-up

Presentation - The presentation is usually in written form and supporting detail should be included. Findings or facts should be stated and followed by the corresponding recommendations. Expected results from recommended changes should be listed, with reasons for such expectations. Where material, such as process charts, etc., has been developed, these should be attached, showing the "before" and "after" comparison. The report should be complete so that no additional verbal explanation is necessary.

It is desirable to review reports or recommendations with those directly charged with the responsibility of performing the functions, so that there is mutual agreement on as many of the recommendations as possible. Such review also permits the correction of any erroneous information on which proposed changes may have been predicated. If agreement is reached, it should be so indicated in the report. If agreement is not reached, the recommended changes and arguments against the proposal should be presented in the report so that the higher authority, who must make the final decision, will be in possession of the facts and arguments pro and con. These policies will avoid requests for

supplementary reports by those who make the final decision.

Discussion - Discuss all recommended changes freely with those concerned. Agreement will not only be reached much easier, but the whole report will receive much better reception if it is felt that nothing is being "pinned on them" that they do not know about.

A second reason for open discussion is that the staff survey group is not in a position to know all the facts which may have a bearing on a proposed change. There may be some underlying reasons for a certain procedure in force that have not been located in the study. A cooperative group of supervisors will aid the team by bringing out these reasons. The advisability of the study being a cooperative endeavor cannot be overemphasized. It is up to the survey group to "sell" their ideas to the heads of the department. The "selling" is worth the expenditure of considerable effort by the survey group. If the best system in the world is not "sold", it has small chance of working as well as a poorer, more popular system.

Conclusion - Once definite conclusions are reached, the final report can be developed. In addition to the items to be covered under (1) above, it is well to include a brief summary or check list of recommendations in the final report. This aids in the follow-up. If definite results to be obtained can be stated such as savings or elimination of operations, this should be shown.

Orders - Orders can be of two kinds. First are the temporary directives to the supervisors to get the changes made. Second are the Standard Procedures. (These shall be discussed separately).

Again it is a question of "selling". Individuals who are responsible for putting new methods into effect must understand the natural

reluctance of employees to depart from accustomed work habits. To them, the old way invariably seems the best. They have grooved their notions or thinking and working habits along certain paths so that the old operation seems easier. Anything that upsets this routine is usually considered slower, harder, more conducive to errors and unnatural, and the employee decides that it is bad.

If the survey group has done a good job of "selling" to the supervisor, the directive to the heads of the department will be nothing more than an official "go-ahead", as they will already be in agreement with the suggestions and in many instances will probably have put some of them in force or have them underway. Where there has been disagreement, a definite decision must be reached by a higher authority and a directive issued.

While instructions can be issued to the employees, it is still a question of salesmanship. In other words, the changes should be explained. Let them know the reason WHY. Explain that the change is not for the purpose of making anyone work faster. Rather, it is to simplify, eliminate wasted effort, and reduce fatigue in order to make the job easier.

Follow-up -

a. To see that all recommended changes have been made effective.

b. To see if the changes operate as anticipated.

c. To get a measure of the results expressed in terms of reduction of organization or increased volume handled.

d. To see if changes when not functioning properly can be made to function. Possible reasons for lack of proper

application may be:

(1) Insufficient instructions

(2) Misunderstanding regarding instructions

(3) Lack of desire to effect the change

(4) Insufficient follow-up by the supervisor

(5) Conditions outside of the departmental control when the new procedure depends on a change by another group.

The follow-up should be a joint responsibility of the survey group and those in charge of the department. Everything on the summary of recommendations should be checked. Sufficient time should be allowed so that there has been a reasonable time to effect the changes.

A report should be issued showing the results of the follow-up survey.

VIII. STANDARD PROCEDURES

A. GENERAL

Standard procedures, or standard practice instructions, as they are sometimes called, are usually written up for each procedure or routine and will usually include the work of more than one individual. That is, the standard procedure is written up from the standpoint of the work involved by all the individuals necessary to carry out an objective, rather than from the standpoint of the various tasks an individual is required to carry out throughout the day, week, month, etc. This latter method is carried out through the function of job evaluation and its resulting job descriptions usually published in the organization manual.

Standard procedures are write-ups of established procedures for the carrying out of various activities or the performance of certain kinds

of work. Such write-ups constitute the "system" of the enterprise, but should not be allowed to degenerate into the class of unnecessarily complicated routines commonly called "red tape".

The organization chart of an enterprise will tell "where" the function is placed, the organization manual tells "what" the detailed nature of the function or position is and indicates its relationships to other functions and positions while the standard procedure tells "how" the functions are carried on and the duties and responsibilities are to be discharged. It is necessary to have procedures written up, not only for the guidance of new employees performing the work - so that it is all done according to instructions - and the training of new employees, but also because many of the important procedures cover several sections and departments, some of which are feeders-in of information that others must then compile and use in carrying on their work.

Thus the procedure of handling time tickets covers not only getting the workers' time on jobs, but also the checking off of completed work from production schedules, the making up of the payroll to pay workers, the charging of time to jobs or kinds of product to get current costs and record data for future estimating, and posting of entries in the general accounts. In addition, these time tickets form the basis for social security pay roll deductions and taxation and reports to workers and the government on earnings and withholdings. The time tickets are only one of hundreds of items for which standard procedures are not only helpful but imperative.

Standard procedures may range from a detailed statement of clerical routine to a broad statement of executive policy. The extent to which details are carried will depend upon the organizational level affected by it. The lower the level to be reached, the more detailed it must be.

B. POINTS TO CONSIDER

Because conditions in different companies vary, no standard outline for the formulation of a standard procedure can be easily suggested. However, the following points should be considered:

1. Where (in what plant, territory and/or department) does the procedure apply?
2. What is the procedure about, i.e. subject? This may be covered in the title.
3. When is the new plan or procedure effective, i.e. date?
4. What is the present or current plan? This may be answered by indicating the number and date of the standard procedure the new plan is to replace.
5. Who is responsible for the performance of individual operations? (Indicate by job or position title). A separate list of all persons or departments concerned as well as who will do each step.
6. What is the procedure? This will list in detail the steps in outline form, in sequence, and will make up the body of the standard procedure. It should be supplemented by process charts and other illustrations.
7. How are the various steps to be performed? This should include equipment, supplies, etc. necessary and also detailed operational charts and layouts listing the movements for the individual operational cycles if such analyses have been made.
8. Are approvals or signatures to show that the method has been

authorized shown?

9. Has a number been assigned to the standard procedure?

10. Are the forms involved clearly indicated by number and with samples? Samples will help eliminate reference.

11. Does each page contain a page number and the total number of pages?

12. Have any general policies on which the procedure is based been given?

13. Are examples and illustrations provided as necessary?

14. Has it been classified as to whether it is a general, departmental, or operator procedure?

15. If the procedure has been revised have the specific changes been clearly distinguished?

16. Is there adequate information concerning the source of material and the disposition of results?

As much as possible a standard form should be adopted and all procedures written up in accordance with this standard. Thus the principles and rules under standardization and form design apply to procedure write-ups.

C. ILLUSTRATIONS OF CURRENT PRACTICE FOR THEIR PREPARATION

The A. B. Dick Company and the Carrier Corporation have prepared standard procedures for the preparation of procedures. Samples of these are shown on the following pages. The following points should be noted in regard to the set-up at the Carrier Corporation:

1. The Procedures (or Methods) Section is responsible for all interdepartmental clerical procedures within the Corporation. Time study and production methods are a function of the Manufacturing

Division.

2. New or revised inter-departmental clerical procedures may be written in rough draft form by any employee for screening by the Procedures Section. However, a large number of the changes are caused by various departments requesting an analysis of their clerical methods by the Procedures Section or by this section pointing out possibilities for improvements and obtaining permission to conduct surveys and recommend improvements.

3. New or revised <u>intra</u>-departmental procedures are usually handled within the department involved and may or may not be issued directly to the manual holder within the department. The Procedure Section may or may not serve in an advisory capacity in these instances.

In the A. B. Dick Company, the responsibility for standard procedures is assigned to the line management group. The Staff Assistant-Procedures has the responsibility of collaborating with Division, Department, and Section Managers when requested or when the need arises in the preparation of these procedures. To secure uniformity in the published instructions covering procedures, they are all issued by the Staff Assistant-Procedures.

Carrier	INTER-DEPARTMENTAL STANDARD PRACTICE INSTRUCTIONS CARRIER CORPORATION, SYRACUSE, N. Y.	DATE EFFECTIVE 5/7/45 DATE ISSUED 4/27/45	INSTRUCTION NO. B-2 PAGE 1 OF 2
SUBJECT	PROCEDURES, FORMS AND ORGANIZATION CHARTS	SUPERSEDES B-2 12/1/43	UNIT General

PURPOSE

The purpose of this procedure is to establish and insure standardization of all inter-departmental procedures, printed or duplicated forms, and organization charts.

RELATED PROCEDURES

Detailed information and instructions are covered in the related procedures listed below:

B-3 - Preparation, approval and distribution of Inter-departmental Instructions.

B-4 - Forms Control.

B-5 - Preparation, approval and distribution of Organization Charts.

RESPONSIBILITY OF PROCEDURES SECTION

The Procedures Section has been established by the Management to effect the following:

1. Coordinate and standardize inter-divisional and inter-departmental systems and procedures.
2. Survey and revise clerical procedures, where necessary.
3. Recommend the elimination of obvious duplication through the correction and flow of paper work.
4. Develop and install new or improved clerical procedures.
5. Prepare and edit inter-departmental instructions.
6. Control and distribute all inter-departmental instructions.
7. Establish and maintain proper procedure over all printed forms. (Forms, Tags, Labels, Letterheads and Envelopes).
8. Final preparation and distribution of all organization charts.

It will be the responsibility of each Department Head to see:

That the functions pertaining to the authority and responsibility of the Department are covered properly by written procedures.

APPROVED BY ______________________ DATE ______

THESE INSTRUCTIONS WERE REVIEWED BY THE HOLDER OF THIS MANUAL

INITIALS OF HOLDER

OBSERVANCE OF PROCEDURE

When a new or revised procedure is issued it becomes effective upon the date specified and all previous written or verbal instructions covering the specific procedure will be voided at that time.

PROCEDURE REVIEW AND APPROVAL

All inter-departmental procedures will be checked, revised and/or corrected, if necessary, by the Procedures Section to insure coordination, then distribution will be made to the Standard Practice Instruction Manual after approval of the departments affected and final approval by the Comptroller.

FORM REVIEW AND APPROVAL

All printed or duplicated forms, before printing, must be cleared through the Procedures Section where they will be checked, revised and/or corrected, if necessary, to insure standardization. All forms sill be ordered by the Procedures Section after approval of the departments affected and final approval by the Supervisor of the Procedures Section.

SUBJECT PREPARATION, APPROVAL AND DISTRIBUTION OF INTER-DEPARTMENTAL STANDARD PRACTICE INSTRUCTIONS

PURPOSE

The purpose of this procedure is to standardize the preparation, approval and distribution of all inter-departmental instructions.

PREPARATION

After writing an original draft of a proposed new or revised procedure, the employee will have it typed, double spaced, then prepare a written memo addressed to the Supervisor of Procedures, showing the following:

1. Date.
2. State, new or revised procedure.
3. Proposed title (new procedure).
4. Instruction number (revised procedure).
5. Reason revision is necessary must be clearly stated.
6. Signature of Department Head.

REVIEW OF SUBMITTED PROCEDURES

The Procedures Section, upon receipt of a proposed new or revised procedure, will review and/or rewrite the procedure, if necessary. This will be determined after:

1. Analysis of information submitted.
2. Research in related procedures, as outlined in other instructions and in the use of forms.
3. Personal contact with the departments or divisions which will be affected by the new or revised procedure.

DRAFTING OF PROCEDURES

After an outline has been made and the proper arrangement of paragraphs determined, the following points should be considered:

1. The title of the procedure should be brief and clearly define the subject.
2. A simple, direct style of writing, using short sentences and unified paragraphs, is recommended. As a rule, future tense will be used.
3. Use titles of individuals, not names.
4. When a form is first mentioned, state the form name and number. Future reference to the form will be made by number only.

APPROVED BY ____________________ DATE ________

APPROVED BY ____________________ DATE ________

THESE INSTRUCTIONS WERE REVIEWED BY THE HOLDER OF THIS MANUAL
INITIALS OF HOLDER

INTRODUCTION OF A FORM

The introduction of a printed form into written procedure will be handled as follows:

1. State the number of copies and where originated.

2. Explain in general terms the method of preparation, the information to be recorded on or taken from the form.

3. State how the form is to be made out, typewriter, billing machine, longhand, etc.

4. Indicate titles of persons who are to sign and approve the form.

5. Show distribution of each copy.

6. Show final disposition and method of filing each copy.

PREPARATION OF FORM G-1

After the proposed new or revised procedure has been reviewed, the Procedures Section will have sufficient copies typed, double spaced, on Form G-1 and distributed to the Heads of the various Departments or Divisions affected.

PREPARATION OF FORM G-2

The Procedures Section will prepare sufficient copies of "Request for Procedure Approval", Form G-2, to submit the tentative procedure to the supervisors affected. Form G-2 will indicate all individuals to whom the procedure has been forwarded and the date this procedure must be returned.

REQUEST FOR PROCEDURE APPROVAL

The employee receiving a copy of Form G-2, with the attached tentative procedure, will, after reviewing the proposed procedure, act as follows:

1. Approve "as submitted", then return to Procedures Section.

2. Approve "as corrected", inserting between the double spaced lines any recommended changes or attaching a supplementary sheet with the proposed changes, then send to the Procedures Section.

<u>Note:</u> <u>If Form G-2 is not returned by the date requested, the procedure will not be held up for issuing to the Standard Practice Manual</u>.

SUBJECT

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MANUALS

APPROVED BY

FINAL DISTRIBUTION OF PROCEDURE

When the copies of Form G-2 covering the tentative procedure have been received by the Procedures Section, the recommended changes will be tabulated and analyzed. The Procedures Section will coordinate the suggested changes by personal contact with the departments involved. In case a major change is necessary, the procedure will be revised and sent out again for approval to only those directly concerned.

FINAL APPROVAL

After necessary approvals have been secured and the necessary changes made, the final draft will be submitted to the Comptroller for final approval before distribution is made to the holders of SPI manuals

ISSUANCE OF SPI MANUALS

All employees who require written procedures for the efficient performance of their duties will be issued on SPI manual. Each manual will contain those instructions dealing with the work or duties of the employee receiving the manual and such related procedures as will be helpful.

Complete manuals will be issued only to the General Management, Department Heads and to other employees or individuals designated by the Comptroller.

ISSUANCE OF PROCEDURES

New and/or revised instructions will be issued to each employee charged with a manual and dealing with their duties or related functions. Instructions will be accompanied by Form A-15 (Rev. 4/45). In the case of revised procedures, superseded procedures will be removed from the manual and destroyed.

ADDITIONAL MANUALS AND INSTRUCTIONS

All requests for an SPI manual and for additional copies of SPI instructions will be sent to the Procedures Section, in writing, showing:

1. Date, employee's name and title.

2. Department name.

3. List of the instruction numbers requested.

RETURN OF MANUALS

When an employee is terminated or transferred to another job, the Division or Department Head will obtain the manual before releasing the employee. If a manual is reassigned, the Department Head will notify the Procedures Section, in writing, showing the Manual Number, name of the employee formerly possessing the manual, and the Name and Title of the Employee to whom the manual is being reassigned. Otherwise, the manual is to be returned to the Procedures Section.

SUBJECT					NUMBER A-1
PREPARATION AND REVISION OF STANDARD PROCEDURE INSTRUCTIONS					SUPPLEMENT
					PAGE NO. 1
EFFECTIVE DATE	SUPERSEDES	S. P. I. NO.	PAGE	DATE	
5-1-48		A-1	All Pages	3-13-45	OF 2 PAGES

Summary of Procedure

Standard Procedure Instructions will aid Company management in maintaining control of Company operations. They will provide standardized, written instructions for handling paperwork and related details in accordance with established, uniform procedures.

Heads of organizational units will be responsible for initiating, preparing or revising procedures and Standard Procedure Instructions, in collaboration with the Staff Assistant - Procedures in the Controller's Division.

Staff Assistant - Procedures will be responsible for seeing that procedures are developed and maintained to provide and record all accounting information and related data concerning the Company's operations; assisting and collaborating with all organizational units of the Company in the design, coordination and installation of all procedures; and reviewing, editing and issuing all Standard Procedure Instructions in prescribed form.

Details of Procedure

1 DIVISION DIRECTOR, DEPARTMENT MANAGER OR SECTION MANAGER will recognize need for new procedure or for revision of existing procedure, together with covering Standard Procedure Instructions (including auxiliary Desk Instructions when necessary).

a Head of organizational unit will prepare a statement of proposed procedure or revision of existing procedure, as it applies to his own unit and to other units within the scope of his information.

b Submit this statement in writing to Staff Assistant - Procedures for the purpose of obtaining his assistance and collaboration. Submission of related forms and other pertinent material will be helpful.

c Staff Assistant - Procedures will, on his own initiative or at the request of the Controller, prepare statements of proposed procedures or revisions of existing procedures as in sub-step (a).

2 STAFF ASSISTANT - PROCEDURES will originate or will receive and appraise statements of proposed new or revised procedures to determine:

Divisions, departments, sections or other organizational units concerned in the proposal.

Desirability of proposal in the light of existing Company policies and practices, and in accordance with indicated objectives of management.

a Confer with originator, others concerned in the proposal and with the Controller, as the case may require, in completing the appraisal, and

EFFECTIVE DATE	SUPERSEDES	S. P. I. NO.	PAGE	DATE
5-1-48		A-1	All Pages	3-31-45

in order to determine urgency of the proposal relative to other procedure projects already undertaken.

b Establish procedure work program, with approval of the Controller, and advise originator of proposal of the action to be undertaken.

c Collaborate in the design, coordination and installation of the procedure and required forms. Review, edit, issue and distribute the covering Standard Procedure Instruction (including auxiliary Desk Instructions when necessary). In connection with these activities, obtain the endorsement or approval of the proposed procedure and covering instructions from the Controller, other Division Directors and other personnel concerned.

3 VARIOUS INDIVIDUALS will receive copies of Standard Procedure Instructions (together with copies of auxiliary Desk Instructions when necessary).

a Have Instructions filed in Procedure Manual binders or other suitable housing provided for that purpose.

b Have any superseded Instructions removed and returned to Staff Assistant - Procedures.

c Discuss the procedure and Instructions with Staff Assistant - Procedures when advisable, explain to others under their supervision the use of the procedure, and see to it that the Instructions are followed.

D. SAMPLES

On the following pages are presented samples of standard procedures as used by the following companies:

1. Western Electric Company - M.D.I. (Manufacturing Departmental Instruction) The samples show the form used and cover:
   a. Instruction Bulletins
   b. Schematic diagram to standardize the preparation of M.D.I.'s on reports.
2. A. C. Spark Plug Division of General Motors. The standard procedure for a Request for Change in Routing and a sample of the form to be used and was taken from a manual for supervisors entitled "The Supervisor and Efficiency".
   The purpose of this manual is to provide A. C. supervision with a better understanding of problems concerning efficient operation and their relationship to the Efficiency Department which stands ready to assist when needed.
3. A. B. Dick Company - Standard Procedure Instructions covering a Request for Operation Change.

Western Electric Company, Inc.
Manufacturing Division
Hawthorne

M.D.I. 41.94-H
Reissue June 16, 1948
Replaces pages
1,2 & 3 of 8-12-37

INSTRUCTION BULLETINS

1. GENERAL

1.1 This instruction prescribes the routines and responsibilities for handling Instruction Bulletins.

2. MERCHANDISE DIVISION

2.1 The Merchandise Division is functional for ordering and stocking Instruction Bulletins for the Merchandise Division and for such organizations in the Manufacturing Division as have agreed to include Instruction Bulletins in preliminary packing operations.

2.11 To assure properly edited Instruction Bulletins which are in agreement with current Bell Telephone Laboratories "M" and "CO" specifications all reorders will be placed by the Merchandise Division which is responsible for the accuracy and clarity of the Bulletins.

3. MANUFACTURING DIVISION

3.1 Manufacturing organizations which have entered into local agreements with the Merchandise Division to include Instruction Bulletins in preliminary packing operations shall proceed in accordance with MD 504-C, "Preliminary Packing Instruction Card," to be issued as specified in M.D.I. 25.30 4-H, "Handling and Preliminary Packing."

Copies to:
3215 AFK (15)
All departments, Org. 1000
" " " 2000
All departments 7000

D. LEVINGER,

Works Manager

937-1

Reason for reissue: Complete revision to prescribe the functional responsibility for ordering, stocking and packing of instruction bulletins.

WESTERN ELECTRIC CO., INC.,
MANUFACTURING DIVISION.

M.D.I. 1.12 6-H
APPENDIX A
DECEMBER 5, 1947

TYPICAL SCHEMATIC FOR PREPARATION OF M.D.I.'S ON REPORTS

A SUBJECT TITLE SHALL BE INSERTED WHEN NO "REPORT TITLE" IS SHOWN UNDER "FORM OF REPORT", OR OTHERWISE WHEN APPROPRIATE.

PREFIX DESIGNATING PERIOD COVERED (OR FREQUENCY OF ISSUE); E.G., "M" FOR MONTHLY, FOLLOWED BY A DASH (-) UNLESS REPORT IS AN ESTIMATE OR A FORECAST. SEE LIST #1, BELOW FOR PROPER LETTER DESIGNATION. ADD NUMBER DESIGNATING THE SUBJECT COVERED BY THE REPORT AS PRESCRIBED IN PAR. 2.4 OF M.D.I. 1.12 6; E.G., "MC-353.6".

REISSUE

REPORT NO.

Western Electric Company, Inc.
Manufacturing Division

M.D.I. 1.12 6-

19

DATE

REPLACING DATA FOR REISSUE

REPORT

FORM OF REPORT

(Date) Report 19 Issue

SERIALLY NUMBERED DURING LIFE OF REPORT BEGINNING WITH 1 AND DISREGARDING ANY CHANGES IN PERIOD OF ISSUE OR IN FORM OF THE REPORT.

REPORT TITLE

WORKS, SHOPS, LOCATION OR ORGANIZATION

REPORT COVERING ( )

IN LOCAL INSTRUCTIONS, INSERT PREFIX DESIGNATING ISSUING ORGANIZATION OR LOCATION AS PRESCRIBED IN LIST #2 BELOW. OMIT FROM BROADWAY INSTRUCTIONS.

COLUMN HEADINGS OR BRIEF DESCRIPTION OF THE PARTICULAR TYPE OF SUBJECT MATTER, DATA OR INFORMATION REQUIRED. WHERE COLUMN HEADING CALLS FOR "CURRENT MONTH" THE ACTUAL MONTH SHALL BE INSERTED, E.G. "JANUARY" AND WHERE "CUMULATIVE MONTHS" ARE CALLED FOR THE ACTUAL NUMBER OF MONTHS SHALL BE INSERTED, E.G. "11". INSTRUCTIONS ON INDIVIDUAL REPORTS SHALL INDICATE THIS REQUIREMENT BY ENCLOSING THESE HEADINGS IN PARENTHESES, E.G., (CURRENT MONTH) AND (CUMULATIVE MONTHS).

NOTE: WHEN FOOTNOTES ARE REQUIRED IN PREPARING INSTRUCTIONS, USE LETTERS AT THE BEGINNING OF THE ALPHABET (A, B, C, ETC.) ONLY WHEN THE FOOTNOTE IS OF AN INSTRUCTIONAL NATURE, INCLUDING FOOTNOTES HAVING TO DO WITH THE METHOD OF COMPUTING THE AMOUNT TO WHICH THE NOTE IS KEYED. SHOW A REFERENCE TO THE PARAGRAPH OR LINE AND COLUMN OF THE REPORT TO WHICH THE NOTE APPLIES, E.G.:
"NOTES: A (PARAGRAPH 1 INCLUDE ....
B (LINES 4 & 9, COLS. A TO F
[illegible] ...."

AUDITOR'S APPROVAL, WHEN REQUIRED

APPROVED ______
(TITLE OF APPROVER)

TITLE OF EMPLOYEE WHO IS TO SIGN REPORT (E.G., "WORKS COMPTROLLER") OR, IF HE HAS NO FORMAL TITLE, CHIEF OF (NAME OF HIS ORG. (E.G., "CHIEF OF GENERAL APPARATUS COST ACCOUNTING DEPT.")). WHEN THE TITLES OF THE INDIVIDUALS DELEGATED TO SIGN REPORTS VARY AT THE VARIOUS LOCATIONS THE SIGNING AUTHORITY SHALL BE DESIGNATED AS FOLLOWS:" (NAME) IN CHARGE OF (FUNCTION)

Next report due ____(DATE)____ 19____

(ANY REFERENCE NOTES)

PERIOD COVERED, DISTRIBUTION AND SCHEDULE

This report covers (insert period covered; e.g., "fiscal months") and shall be issued a follows:

WHERE MORE THAN ONE MANUFACTURING LOCATION IS FURNISHING REPORT INSERT TERM "WORKS". WHERE ONLY ONE LOCATION OR A SPECIFIC ORG. IN THE MFG. DIV. IS INVOLVED USE SYMBOL SHOWN IN LIST 2, BELOW, E.G. "MD", "EP", ETC.; WHERE INFORMATION IS TO BE FURNISHED AS A COMBINED REPORT FOR THE MFG. DIV. TO ANOTHER DIVISION USE SYMBOL "MD", WHERE NO SYMBOL IS PRESCRIBED USE NAME OF ORG. PREPARING REPORT, E.G., "LEGAL".

ORGANIZATIONS FROM WHICH REPORTS ARE COMMONLY REQUIRED SHALL BE DESIGNATED IN B'WAY INSTRUCTIONS AS SHOWN IN LIST 3, BELOW.

Report	Required From	By	Copies to	Date Due At Destination

IN WORKS ISSUES INSERT NUMBER OF ORG. FROM WHICH REPORT IS REQUIRED, E.G., 2063-3

WHERE WORKS LOCATIONS FURNISH INFORMATION TO A HEADQUARTERS ORG. IN THE MFG. DIV., THAT REPORTING ORG. SHALL (UNLESS OTHERWISE PRESCRIBED) BE RESPONSIBLE FOR ISSUING THE ASSOCIATED MD REPORT, IF AN MD REPORT IS SPECIFIED.

WHEN MORE THAN ONE COPY IS REQUIRED PLACE THE NUMERAL IN PARENTHESES FOLLOWING THE TITLE (E.G., ACCTG. DIV. (3)), OR REFERRING TO AN ASST. DIV. COMPTR. DESIGNATE WHICH ONE BY USING THE FOLLOWING:
ASST. DIV. COMPTR. (BUS. METHODS)
" " " (OPER. RESULTS)
" " " (PROD. RESULTS)

ENTER IN ONE OF THE FOLLOWING WAYS:
20TH WORKING - DUE ON 20TH WORKING DAY FOLLOWING END OF PERIOD COVERED BY REPORT.
20TH CALENDAR - DUE ON 20TH CALENDAR DAY OF MONTH FOLLOWING PERIOD COVERED BY REPORT.
2/20 - DUE FEBRUARY 20TH.
NOTE:
"WORKING DAYS" ARE MONDAYS THROUGH FRIDAYS, EXCLUDING HOLIDAYS.
"HOLIDAYS" ARE THOSE DAYS OBSERVED AS SUCH AT THE ISSUING LOCATION.
WHERE A DUE DATE FALLS ON A SATURDAY, SUNDAY OR HOLIDAY, THE REPORT SHALL BE DUE THE FOLLOWING WORKING DAY, EXCEPT IN THE CASE OF REPORTS IN THE 13 SERIES WHEREIN THE REPORTS SHALL BE DUE THE PREVIOUS WORKING DAY.

LIST # 1

LETTERS	MEANING
D	DAILY
BD	BI-DAILY (EVERY SECOND DAY)
W	WEEKLY
BW	BI-WEEKLY (EVERY SECOND WEEK)
SM	SEMI-MONTHLY, FISCAL
SMC	SEMI-MONTHLY, CALENDAR
M	MONTHLY, FISCAL
MC	MONTHLY, CALENDAR
BM	FISCAL, BI-MONTHLY
BMC	BI-MONTHLY, CALENDAR
Q	QUARTERLY, FISCAL
QC	QUARTERLY, CALENDAR
QM	EVERY 4 MONTHS, FISCAL
QMC	" " " , CALENDAR
SA	SEMI-ANNUALLY
A	ANNUALLY
O	OCCASIONALLY

LIST # 2

LETTERS INDICATING ORGANIZATIONS ISSUING THE REPORTS

PREFIX	FOR REPORT ISSUED BY
AS	ARCHER AVE. SHOPS (HAW. WKS.)
BU	TONAWANDA PLANT
BW	PT. BREEZE WORKS
C	COMPTROLLER (ACCTG. DIV.)
CS	CLEARING SHOPS (HAW. WKS.)
DU	DULUTH SHOPS (HAW. WKS.)
EM	ENGINEER OF MANUFACTURE (OR EQUIVALENT ENGINEERING ORG.)
EP	ENGINEER OF PLANT
FS	FORTY SECOND ST. SHOPS
HS	HAVERHILL SHOPS (KY. WKS.)
HW	HAWTHORNE WORKS
KW	KEARNY WORKS
LS	LINCOLN SHOPS (HAW. WKS.)
MD	MANUFACTURING DIV. (INC. REPORTS BY DIV. COMPTR.)
QS	QUEENSBORO SHOP (KY. WKS.)
STP	ST. PAUL SHOPS (HAW. WKS.)
YS	ELECTRONICS SHOPS

LIST # 3

ORGANIZATIONS FROM WHICH REPORTS ARE REQUIRED

PREFIX	REQUIRED FROM
A	ARCHER AVE. SHOPS (HAW. WKS.)
B	POINT BREEZE WORKS
C	CLEARING SHOPS (HAW. WKS.)
D	TONAWANDA PLANT
E	ENGINEER OF MANUFACTURE (OR EQUIVALENT ENG. ORG.)
F	FORTY SECOND ST. SHOPS
G	DULUTH SHOPS (HAW. WKS.)
H	HAWTHORNE WORKS
K	KEARNY WORKS
L	LINCOLN SHOPS (HAW. WKS.)
M	MFG. DIV. (COMB. REPORTS)
P	ST. PAUL SHOPS (HAW. WKS.)
Q	QUEENSBORO SHOPS (KY. WKS.)
Y	ELECTRONICS SHOPS
V	HAVERHILL SHOPS (KY. WKS.)
W	HAWTHORNE, KEARNY AND PT. BREEZE WORKS

D. LEVINGER
WORKS MANAGER

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REQUEST FOR CHANGE IN ROUTING

PURPOSE

To authorize changing, adding or removing operations, or revising the sequence of operations from present "Equipment Operation and Standard Time Routings" when the changes are not otherwise authorized through revisions of tooling routings or blueprints.

PROCEDURE

To obtain prompt action on your proposed change, fill out "Request For Change In Routing - Form AC 727" complete with all details requested and add a sketch when possible. (See example on next page).

Obtain the approval and signatures of the department foreman, superintendent and inspection supervisor in the department or departments affected by the change and forward to the Efficiency Department.

Investigation will then be made and approvals as necessary obtained so that routing can be revised.

REQUEST FOR CHANGE IN ROUTING

R. C. NO. 1467

AC 727 3M

REQUEST FOR CHANGE IN ROUTING

R. C. NO. 1467

REASON FOR CHANGE: TROUBLE IN ASSEMBLY CAUSED BY BURR ON BOTTOM SIDE OF TWO FRAME HOLES. ADD OPERATION #30

PART NAME: FRAME — PART NO. 1505392

PRODUCT: OIL GAUGE ASSY. — ASSY. NO. 1506056

CUSTOMER: G. M. TRUCK — EST. MONTHLY REQ. 10,000

REQUESTED BY: JOHN DOE — DATE 5-9-44

PRESENT ROUTING

SEQ. NO.	OPER. NO.		DEPT.
1	10	MACHINE ON HAND SCREW MACHINE	71
2	20	DRILL 2 HOLES IN FRAME ON DRILL PRESS	71
3		INSPECT AND SEND TO ASSEMBLY	171

PROPOSED ROUTING

SEQ. NO.	OPER. NO.		DEPT.
1	10	MACHINE ON HAND SCREW MACHINE	71
2	20	DRILL 2 HOLES IN FRAME ON DRILL PRESS	71
3	30	BURR 2 HOLES IN FRAME ON DRILL PRESS	71
4		INSPECT AND SEND TO ASSEMBLY	171

APPROVAL OF CHANGE

DEPT. FOREMAN (SIGNATURE) — INSPECTION (SIGNATURE)

SUPERINTENDENT (SIGNATURE) — EQUIPMENT

DEVELOPMENT — PLANT LAYOUT

ENGINEERING — EFFICIENCY

TOOL DESIGN — FACTORY MGR.

TRANSFER EQUIPMENT

NO TRANSFER OF EQUIPMENT NECESSARY. 2 SPINDLE DRILL PRESS AVAILABLE.

SUBJECT					NUMBER A-24
REQUEST FOR OPERATION CHANGE					SUPPLEMENT
					PAGE NO. 1
EFFECTIVE DATE 9-1-48	SUPERSEDES	S.P.I. NO. A-24	PAGE 1 Page	DATE 10-14-46	OF 1 PAGES

Summary of Procedure

Request For Operation Change (Form F 806 Rev.) will be used to request a temporary process change in method of manufacturing a part, or to request a permanent revision in the manufacturing method. A request for a temporary change will apply to one specific production lot only.

Originator (Foreman or other employee) will prepare a request in accordance with detailed instructions given below, and will secure written approval thereon from his immediate supervisor before sending the request to Methods Section of Methods and Maintenance Department in Manufacturing Division.

Methods Section will analyze the Request; designate it as a permanent change to be handled in accordance with Process Change Order procedure (SPI A-71) or as a temporary change under Process Deviation Permit procedure (SPI A-27).

Details of Procedure

1 ORIGINATOR (FOREMAN OR OTHER EMPLOYEE) will prepare Request for Operation Change (Form F 806 Rev.) in triplicate, filling in the following information:

Part No.
Operation No.
Department No.
Date
Temporary or Permanent - Check whichever is applicable
Details of desired change
Reason for change

If the request is for a temporary change in the method of manufacture, the number of pieces and the lot number affected will be shown under "Details of Desired Change".

Foreman or Supervisor will sign original and forward it with the duplicate to Methods Section.

2 METHODS SECTION will receive Request for Operation Change from Originator who signed the request.

Analyze the request.

Assign requests for permanent change to a Methods Engineer by recording name on request; pass both copies to Methods Engineer. (See SPI A-71).

On requests for temporary change, review, and accept or reject, consulting with Tool Engineer, Methods & Maintenance Manager and/or Factory Superintendent, if desired. If accepted, place check in "accepted" space on both copies and enter date and signature. Give both copies to Control Clerk. (See SPI A-27). If rejected, place check in "rejected" space and write reasons for rejection on reverse side; send original to Process Sheet master file and duplicate to originator.

E. EXTENT OF CURRENT PRACTICE

The number of M.D.I.'s published by the Western Electric Company make up several volumes. The A. B. Dick Company has prepared a list of Standard Procedure Instructions in current use by that company. A copy of the first page of this list is presented here to illustrate the extent to which this company has progressed in the write-up of procedures. The list consists of a total of seven such pages.

LIST OF STANDARD PROCEDURE INSTRUCTIONS

Index tabs indicate those included in this binder

SPI No.	Effective Date	Title
A-1	3-13-45	Preparation and Revision of Standard Procedure Instructions
A-2	2-1-48	Procurement and Approval of Part Samples
A-3	—	Withdrawn
A-4	7-31-44	Testing Tissue Samples
A-5	7-31-44	Purchases and Sales of Fiber
A-6	6-31-45	Handling Reports on Competitive Supplies and Accessories
A-7	3-15-48	Complaints on Quality of Products
A-8	3-31-45	Inquiries Regarding Production Schedules Of All Standard Items Not Carried in Inventory
A-9	8-1-44	Tool Orders
A-10	11-1-44	Engineering and Manufacturing Changes
A-11	10-11-44	Request For Tracer on Incoming Shipment
A-12	11-20-46	Purchase Requisition Preparation - "G" Series
A-13	1-1-45	Budgeting
A-14	—	Withdrawn
A-15	2-15-47	Flexible Factory Budgets - Jackson Blvd.
A-16	1-1-47	Jackson Boulevard Departments
A-17	1-1-45	Normal Volume and Normal (Standard) Burden Rates
A-18	7-22-46	Preparation of Process Sheet For Non-Current Parts
A-19	7-22-46	Transfer of Information from Old (F 662 and F 663) to New (F 835) Type of Process Sheet
A-20	9-22-47	Working Schedule Notice
A-21	—	Not Issued

Issued 4-1-48

F. RULES FOR REVISION OR CORRECTION

If a provision of a standard procedure is found undesirable or in error, a revision to correct the fault should be promptly issued. The purpose of procedure write-ups is to assist, rather than hinder departmental operations and a procedure should never become an inflexible set of rules. When a particular procedure is revised, it is necessary to make certain that corresponding revisions are made in all related standard procedures, and that copies are properly distributed. The original issue of a procedure can be identified as "issue A" and its revisions by change letters beginning with "issue B" as the first alteration.

On the following page is a sample of a form used for correspondence within the A. B. Dick Company and used in this case to release a revised standard procedure.

Verbal deviations from a procedure should not be permitted as this will lead to the entire procedure system falling apart. In cases where immediate change or correction of a procedure is imperative, an amendment stating the nature of the revision should be issued from official source to all persons concerned. This amendment will be in the form of a directive or bulletin. In the case of a new procedure several minor changes may be found to be necessary. The most practical policy here is to issue two or three amendments before reissuing the revised procedure incorporating the changes.

A. B. DICK COMPANY
Reply on Blue Sheet. Retain
Buff Copy for Your Files

SUBJECT: Standard Procedure Instruction A-1 Revised

May 1, 1948
Date

REFERENCE:

To:

From: STAFF ASSISTANT - PROCEDURES

Enclosed is a copy of revised S.P.I. A-1, "Preparation and Revision of Standard Procedure Instructions", dated 5-1-48, for insertion in your Procedure Manual.

Please return S.P.I. A-1, dated 3-31-45 (4 pages) and accompanying Flow Chart to us for cancellation.

The principal change reflected in this procedure and covering instruction is the delineation of responsibilities for initiating, preparing and revising procedures. Heads of organizational units are made responsible for these activities in collaboration with Staff Assistant-Procedures. Systems and Procedures Department has been replaced by the Staff Assistant - Procedures in the Controller's Division.

Copies of this S.P.I. are being distributed to all persons who have Procedure Manuals or have only certain S.P.I.'s for their own use.

Any questions regarding this procedure should be referred to W. M. Carrithers, extension 315.

Please acknowledge receipt on the attached duplicate.

WMCarrithers:mp

Enclosure

G. SUMMARY OF REASONS FOR STANDARD PROCEDURES

Throughout this thesis many reasons and bases for writing up procedures have been presented. The following list is given as a summary of these reasons for the establishment of standard procedures in industry:[9]

1. Determination of manpower needed

   A given volume of work performed in a standard manner, under like conditions, at a uniform rate, should require a certain number of man-hours. This affords a basis for checking performance; actual against desired.

2. Determination of Cost

   Aside from lowered cost, it is desirable from a control standpoint to know what the cost of doing a specific piece of work should be. This includes payroll, material, supplies and other items as well.

3. Determination of time

   It is important for such other reasons as improving service to customers, meeting delivery promises, handling orders, preparing reports, and submitting estimates. It provides a basis for planning scheduling, and assigning work to individuals, departments, plants or offices.

4. Assurance of quality or accuracy

   The quality of work expected is established definitely. For office operations accuracy of performance is prescribed.

5. Facilitation of supervision

   Situations which are variations from normal are minimized. It

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9 Adapted from Holden, Fish and Smith, "Top Management Organization and Control", The Standford University Press, 1948.

enables executives to concentrate attention on matters which are exceptional, resulting in consequent improvement in supervision.

6. Interchange of personnel

If, throughout an entire company, an activity is carried out in identical manner, those engaged in the activity can be shifted from one unit to another with no reduction in proficiency and with no loss in time for learning.

7. Training new employees

Standardization of procedures implies standard instructions or procedure manuals, either of which provides a new employee with detailed information as to his specific duties with respect to any activity. Moreover, it takes no longer for a new employee to learn a well-defined method than to learn by word of mouth a procedure which may change from day to day. Then, too, the learning process can proceed with a minimum amount of coaching and explanation upon the part of the new employee's supervisor or associates.

8. Reliance on procedure

It is much safer to fix definite methods of carrying out repetitive activities than to depend upon uncertainties of memory and variable judgment of those involved in the activities. Only by prescribing fixed practices can consistency and permanency be given to the conduct of such activities.

9. Capture of basic information

One of the most important objectives of establishing standard practices is to corral certain basic operating data which otherwise reposes solely in the minds of long-service employees.

Such information is the rightful property of the company, as it has been gathered on time paid for by the company. Unless, through standardizing practices, it is gathered piece-meal from those possessing it, certain portions of it are lost every time there is any turnover of personnel. To be sure, a synthesis of such captured data may not produce the best way of performing a given activity, but the foundation for developing the proper standard practice does lie fundamentally in this information.

10. Incorporation of policies

The preparation of standard practice instruction or procedure manuals provides the opportunity for incorporating positive statements of policy. Numerous company policies can be given positive definition, and therefore uniform interpretation, through the medium of standard practice statements. Moreover, a means is provided whereby checks can be instituted as to complience with policies, a method of control not easily recognized otherwise.

11. Central office control

Where a company has branch offices or a number of plants, legal, statistical and accounting considerations require establishment of uniform practices.

The ultimate objective of standard procedures should be to have every necessary task in the company recorded so that if any part or all of the personnel were to die or otherwise become unavailable for work, they could be replaced by others with basic experience in each of the functions and with reference to the standard procedures the operations of the company could return to full capacity with a minimum of delay.

IX. MANUALS

Standard procedures should be located in a convenient place accessible to all requiring the information they contain. They must be classified or filed for easy reference. The best means for doing this is to make up a manual.

The types of manuals or means of classifications used will depend upon the individual company.

A. ARRANGEMENT

In a small company, standard procedures may be placed with other pertinent data to form a book. As an example, such a book might have the following contents:

1. History of the company.
2. Policy of the company in its dealings with others.
3. The company rule book, covering:
    a. Hours
        (1) Punctuality
        (2) Overtime
    b. Vacations and holidays
    c. Salary payments
    d. Changes in addresses
    e. Personal calls
    f. Ordering supplies
    g. Use of telephone
    h. Use of messenger service, etc.
4. Standard Procedures

    Covering the standard methods of performing work.
5. Current practice

Covering the current method of performing operations which have not been standardized.

6. Individual standard practice and current practice sheets.

   Covering the particular instructions for each employee's job.

Such a manual would form a series of pamphlets or sheets, and no one clerk would have all of them. Each clerk, however, should be furnished with sections 1, 2, 3 and 6.

An example of a type of classification of manuals used for larger companies is as follows:

1. General or company-wide instructions
   a. Matters of organization
      (1) Organization charts; outline of responsibilities of officers, executives, and supervisors
      (2) Job analysis
   b. Matters of policy
      (1) All general policies of company wide significance
   c. Matters of procedure
      (1) Procedures of a general nature which are necessary to operations throughout the company
      (2) Procedures established by one division for the guidance of another division
2. Departmental instructions (A separate manual for each department)
   a. Matters of policy
      (1) Special or detailed policies of interest only to employees of one department
      (2) Such general policies as is deemed wise to publish to the department
   b. Matters of procedure

(1) Departmental practices, outlining the procedures and routines applying to one department

3. Job instructions

a. Matters of procedure

(1) Instructions applying exclusively to one job, irrespective of where it exists in the company

4. Employee handbooks

a. Matters of policy

(1) Booklets distributed to all employees outlining personnel policies and general information about the company.

b. Matters of procedure

(1) Booklets of procedures required of all employees

A final method and probably the most practical is to have manuals classified according to the following types: (1) Organization, (2) Policy, (3) Procedure and (4) Employee Handbook. Under each of these for numbers 1, 2 and 3 above, information can be placed in separate general, departmental and operator manuals. Employee handbooks are ordinarily of a general nature. The discussion that follows shall be limited to manuals of procedure.

B. PROCEDURE MANUALS

In modern administrative practice, manuals of procedure are the principle means for the recording of facts. The term manual, as used in connection with industrial procedures, refers to the written record or handbook of these procedures. The purpose is threefold; to make instructions definite, to provide an authoritative reference in answer to questions pertaining to procedure, and to improve administrative control. The manuals are prepared, not so much for the benefit of management, but for the benefit of employees and the assistance of management.

Every organization and every department will include different types of information in a manual of procedure, depending upon the nature of the work being done. One department may have comparatively simple procedures, but its volume of work may be a major problem, its manual would contain work loads and scheduling information. Another department may have a small volume of work but complex procedures; in this case, a manual emphasizing procedures would be most useful. Still another department may perform jobs which are simple in procedure and light in work load, but material supplies may be a major problem; here a manual containing procurement, storage, and supply information would be most valuable. In all cases, the manual of procedures represents the "core" of the job to be done by each individual, department, or group.

Any discussion of manuals of procedure can only suggest how to build a manual and what to include in it. Four basic premises should be taken into consideration in the development of a manual:

1. For a manual of procedure to be used, it must be useful.
2. The information included must be consistent with the interests of the persons using the manual.
3. The manual must be so prepared and arranged that changes can be readily made to keep it current.
4. Pictures, charts, diagrams, and samples should be substituted for words whenever possible.

Experience shows that manuals of procedure are used by three groups of individuals:

1. Executives of the organization and visitors from outside the organization have an over-all interest in the purpose and work of the group, i.e., the results.
2. The supervisor, whose duty is to produce the results, is interested in the job steps necessary to complete the work.
3. The operators, whose duty is to operate machines and handle clerical functions, need to know specifically how to do each element of the job.

It is impossible to compile a single manual which will be of greatest service to all three classes of people. The executive would not be directly concerned with operating instructions furnished the operator; any such machine and clerical information would be more confusing than helpful to him. The supervisor has department-wide responsibilities which are not the direct concern of either operators or the executive. The operator has detailed responsibilities for machine operation and clerical functions which should not be the continued concern of the supervisor once the job has been set up and instructions issued. The most satisfactory service is rendered by the use of three manuals--one for each of these groups.

The preparation of three manuals has an added advantage of establishing method in the work and thinking of the person preparing the manual. Any job is performed most effectively when attacked methodically. As already presented this will consist of determining the ultimate objectives, determining the facts with which to start, devising methods of procedure so that the objectives can be reached from the starting point, and the study of each part of the procedures to determine how each step will be accomplished.

If the manual is so developed, then it should consist of three sections:

1. A General Manual showing ultimate objectives, source information and the general procedure of accomplishing the jobs. This information is usually desired by executives and visitors, but should also be available to departments.
2. A Supervisor's Manual which shows all the job steps of the procedure and perhaps other information pertaining to machines, personnel and procedures. This becomes the basis of the supervisor's work.
3. An Operator's Manual which gives the operator all the details of each job step needed to perform the work.

This division into three manuals may not be the ideal physical arrangement, nor will the suggested content of each manual necessarily meet the requirements of all situations. It is felt, however, that the development of the manual by starting with the general and working toward the specific is the best sequence to follow.

If the manual is to be kept current it must be arranged physically in such a way that changes can be made with a minimum of effort. The only manual which requires articulate form and appearance is the general manual. This information, being general, requires few changes, and a given set of information remains current for a longer period of time. The supervisor's manual changes more frequently, but requires few reproductions so that even a typewritten recording is generally satisfactory and can be changed easily. The operator's manual may require reproduction for distribution to the various operators. For this purpose, typed copies, ditto, or mimeograph reproductions are often used.

For ease in changing and flexibility all manuals should be loose-leaf. Notebooks which accomodate the standard $8\frac{1}{2}$" x 11" paper are generally satisfactory.

All the material should be well illustrated. Words alone often have little meaning, even to the person who takes the time to read them. Whenever and wherever possible, replace or supplement worded instructions and descriptions with charts, graphs, drawings, pictures, samples, diagrams, or other illustrations.

Some means should be available for determining who has what types of manuals. A simple way to accomplish this is to have each manual serially numbered so that distribution may be recorded. Each individual charged with a manual should be responsible for its upkeep. All changes should be made as soon as authorized notice is received. All manuals should be collected periodically and reviewed as a check on their general condition, and to see that changes have been incorporated.

1. THE GENERAL MANUAL

A general manual shows exhibits of documents, reports and records. They may contain simple process charts which show the general outline of the job.

The first step is to determine:

a. What reports are desired?

b. What form should the reports take?

c. Do they contain valuable information?

d. Is all the information being used?

e. Are the reports too detailed?

f. When should the reports be presented?

The second step is to determine all source information available.

The following inquiries are made:

a. Do the source documents contain the desired information?

b. Will the documents be available when they are needed?

c. Are the documents sufficiently legible?

d. Is redesign desirable or necessary?

Once these reports and documents have been listed and samples of each collected, the general manual is practically complete. The only remaining part of the general manual is the development of application process charts. These are drawn to emphasize the documents, files, forms and reports - the materials which move through the procedure. Thus material might be arranged as follows:

a. Schedule of reports

b. Sample documents

c. Sample reports

d. Process charts

A schedule of reports may be made up classifying the reports as to type, application, or according to due-out sequence, etc. An exhibit letter may be shown beside each report as a reference to the actual samples of reports and documents which follow in the manual. Other columns would include the time or date the report is due in and out and the place or persons from which it came or will go.

2. THE SUPERVISOR'S MANUAL

The supervisor's manual consists mainly of procedure data, supplemented by data on equipment and personnel. When procedures have been developed which best accomplish the desired results, the supervisor must know the unit functions or job steps required to bridge the gap between source documents and final reports. Here great advantage may be taken of process charts. These are usually designed primarily for the supervisor's use and are a basis for all of the plans, controls, and evaluations of the department's operations.

3. THE OPERATOR'S MANUAL

The operator's manual will consist of the detailed information pertaining to each step and will include operation charts, job descriptions, sample forms, set-up or layout diagrams, instructions on the operation of equipment, and samples of any reports or documents that must be prepared.

The instructions will be used by the clerks or operators of the department and must be logical and clear. The degree of detail will depend upon the nature of the job.

In a large, functional-type organization, each operator may specialize on certain equipment, or routines highly repetitive in nature and may use the equipment or routine layout for several jobs each day. With such a job it is generally more suitable to have a separate sheet or sheets for each job so that by reading such a sheet the details of setting up the work or equipment, the schedule, volume, source, and disposition of forms, reports, and other detailed information pertaining to the work, may be quickly obtained.

It is important that these sheets be so numbered or identified that they may be related to the entire procedure. These are generally numbered according to the job-step sequence number found on the process chart.

It is evident that this method uses the job-step as the unit of operational control. They are most suitable where the volume of work is large and each step has been carefully analyzed and studied and schedules have been set. This would compare to a manufacturing instruction sheet. An example of its use in a procedure would be a sorting operation using punched card equipment.

Where volume is usually small, or where procedures are more complex, the job-step is too small a unit of work for effective operational control. For these departments, the procedure of job write-ups can be used to best advantage. In this case the procedure becomes the unit of work, and the instruction is of the entire procedure or a large portion of it. This has been previously illustrated and is the more common practice in clerical or managerial work.

It might appear upon superficial inspection that a procedures manual would be required in large departments and that small departments could depend upon the department head to define verbally departmental policies, rules, and procedures whenever the need arose. However, this will only lead to conflicting decisions over a period of time, particularly when long periods elapse between recurrences of similar questions. Also, too much of the executive's time may be consumed in conveying instructions on routine matters. The time spent in explaining a procedure or policy once is little greater than that required to prepare the information as a written procedure - thus answering the question permanently for all concerned.

X. CONCLUSION

It has been the objective of this thesis to present as much data as is currently available in the field and texts on the writing up and control of standard procedures.

An attempt has been made to point out that:

1. During the preparation stages of procedures, overlapping func-

tions, duplications of work, uncoordinated relationship between departments, inconsistencies in operations, and wastes of time, effort, and money are recognized and eliminated.

2. A procedures program provides a basis for refinement of existing procedures and development of new ones.
3. New procedures and the refinement of methods can best be carried out by reducing the procedures to writing.
4. Procedures are an excellent medium to use in training employees.
5. Procedures define responsibility and reduce errors by telling each individual to whom and for what he is responsible.
6. The use of manuals of procedure makes results uniform. However, unless the manuals are accessible for employee's use and are faithfully followed much of their value is lost.
7. The procedure manual relieves the supervisor of considerable detail, facilitates other important duties and provides a basis for scheduling, exercising controls, measuring production, and for evaluating equipment and personnel performance.

Facts left unrecorded often cease to be facts. Just as folklore, passing from generation to generation by word of mouth, may accumulate fantasy and lose accuracy, so the everyday facts, procedures and organizational details of modern industry and business may be distorted unless they are set down for the record. Recorded facts are lasting, dependable tools.

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