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PERSONNEL PERFORMANCE EVALUATION IN RESEARCH AND DEVELOPMENT ACTIVITIES: MOTIVATION THROUGH THE JOB

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PERSONNEL PERFORMANCE EVALUATION IN RESEARCH AND DEVELOPMENT ACTIVITIES: MOTIVATION THROUGH THE JOB

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THESIS

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ABSTRACT OF THESIS

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Division of Public Administration
The University of New Mexico, 1970

The proposition of this thesis is: personnel performance evaluation structured as an integrated part of a management process of work assignment and review which involves participation by the employee can be a useful vehicle for employee motivation through the job in government research and development activities. Although performance evaluation is only one of the many facets of the supervisor's job, structured as proposed, it is found to have potential as one means of sustaining and increasing employee motivation in the R&D environment.

This thesis seeks to assist the R&D supervisor in carrying out his day-to-day personnel management responsibilities through a work-centered approach to performance evaluation. Therefore, it analyzes areas over which the individual supervisor normally has some degree of control, i.e., the work assignment and review process.

Using a descriptive approach, the method of attack is to analyze and evaluate research-based management and motivation studies in an effort to determine if the proposition of the

thesis can be conceptually supported. The works of Douglas McGregor; Herbert H. Meyer, Emanual Kay, and J. R. P. French, Jr.; and Rensis Likert are the major ones considered under the participation in decision-making part of the thesis proposition. The prospect of motivation through the job is examined by analysis and evaluation of the research of Frederick Herzberg, Donald C. Pelz and Frank M. Andrews, M. Scott Myers, Victor Vroom and others. In the part of the thesis devoted to a specific look at performance evaluation within NASA and three of its field centers, source materials used consist of official performance evaluation plans, the comments of Agency personnel administrators and R&D personnel and the first-hand experience of the writer as a personnel specialist in two of the subject NASA centers.

The conclusion of this study is that the proposition of the thesis is conditionally supported from a conceptual standpoint. Some of the conditions found essential to the workability of the proposition are: management philosophy and behavior conducive to a reasonable degree of employee participation in decision-making in matters relating to his job; challenging work; individual need structures in which the noneconomic motivators are largely prepotent; and supervisors skilled in work planning and organization and human relations. This conclusion is further conditioned by the need for more experimental research on the whole subject of the man-job relationship.

The integrated approach to performance evaluation does

not provide a quick solution for employee motivation problems in R&D organizations. An extended period of staff and supervisory training is anticipated to be necessary to effectively implement this approach. However, the recent studies of job factors and motivation show this to be an area of great significance to the supervisor and employee in a time when economic factors appear to have lost much of their former potency.

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CHAPTER I

INTRODUCTION

The Problem

The problem in general

The John F. Kennedy Space Center (KSC), NASA, has had a very highly motivated work force during the period of its rapid growth from a small, remote launch operation in 1962 to the nation's space port as it exists today. Awe-inspiring launch facilities were constructed and the unbelievably complex task of preparing for the Apollo Mission was completed within this time frame.

However, the situation is changing. The Center is reducing its contractor capability according to plan. Its civil service component has undergone slight reductions by the withdrawal of certain manpower slots as they have been vacated.

At present there are no plans for major new launch facilities. Apollo missions have been reduced to two a year. The Orbiting Workshop and Space Shuttle Programs are progressing well within the Agency, but they do not appear to carry the same national significance and public interest as the lunar landing program.

Through the hectic years of Center build-up and the period of the development of the management structure, many

reorganizations were made. These were to facilitate the increasingly complex job of managing space vehicle mission and support contractors employing in the magnitude of 20,000 personnel. Although there were some complaints, these changes were generally taken in stride as necessary disruption in the interest of getting the mission accomplished.

During this period of tremendous growth and expansion, the civil service work force increased from approximately 400 to approximately 2900 engineers, scientists, technicians, administrative and clerical personnel. Many of the supervisory positions created as a part of this organizational growth were staffed by professionals selected for their technical competence. A number of problems surfaced over the years from having large numbers of people in supervisory jobs who had little, if any, real preparation for that aspect of their job. However, the intense interest and challenge of the job at hand provided sufficient momentum to help offset these fumbling moves in personnel management and communication failures. Sixteen hour work days provided little time for supervisory training, nor on the other hand did they leave time for much thought by subordinates on personal complaints, imagined or real.

Now and in the years to come, the Center's supervisors are going to have to supervise. They are going to need help in increasing their knowledge of personnel management and acquiring greater supervisory skill. Much of the glamour of just being a part of a significant and inspiring effort has worn off as evidenced by a steadily increasing number of

complaints and appeals beginning before the lunar landing was even a reality. The tempo of employee organization activity has picked up also in recent years. Supervisors will now need more than respect for their technical knowhow to manage. For one thing, they will have to develop better work communications with their people.

The problem specifics

Using questionnaire and follow-up interview methods, the U. S. Civil Service Commission (USCSC) has indicated in past personnel program reviews of KSC that it appeared improvement could be made in the area of performance evaluation communications between supervisors and employees. In this area, a staff paper was prepared by the NASA Personnel Division in 1966 which stated:

> The Personnel Division's evaluation surveys of installation personnel programs have pointed out the need to provide more effective guidance for managers and supervisors to improve work communications and appraisal techniques. This recognized need still exists, demanding continued attention and effort.[1]

Of course, it is generally recognized that these kinds of statements can be made about most government organizations for a number of reasons, including insufficient quality or quantity of supervisory training, problems of inter-personal communications, the intractable nature of performance evaluation itself and the criterion used by the USCSC to measure the quality of performance evaluation programs, i.e., the Performance Rating Act of 1950.

However, regardless of the merits of the USCSC's

conclusions, the situation of decreased program activity described previously still must be considered. This, along with supervisory weaknesses confirmed by my own experiences in personnel administration over a period of eight years, point to a need for concern and a special effort to assist KSC supervisors in the big job ahead. I shall in this paper seek to help in this situation by examining the nature of and prospects for improving the usefulness of performance evaluation as a supervisory aid at the Center.

I have found over the period of my tenure with KSC that personnel problems, when they arise, all too frequently involved some element of insufficient communication between the supervisor and a subordinate concerning work requirements or performance expectations. This is not really surprising, because, as much of the literature indicates, this is a very sensitive area. Supervisors are reluctant to discuss performance with their subordinates. Minor performance deficiencies often are permitted to develop into major problems before they are broached and this often only makes matters worse.

Can performance evaluation be a positive, constructive aid in job communications and motivation? The prospects appear to be good since it focuses on the employee and his job. A recent study indicates the importance as a positive motivation factor of: "A challenging job which allows a feeling of achievement, responsibility, growth, advancement, enjoyment of work itself, and earned recognition."[2]

Purpose

This study seeks to support the position that personnel performance evaluation structured as an integrated part of a management process of work assignment and review which involves participation by the employee can be a useful vehicle for employee motivation through the job in government research and development activities. Although performance evaluation is only one of the many facets of the supervisor's job, structured as proposed, it appears to have potential as a means of approaching problems of employee motivation which may occur in R&D laboratories which experience decelerated growth after reaching major mission objectives.

Useful concepts of performance evaluation resulting from this study will be proposed for incorporation in the Kennedy Space Center performance evaluation program and supervisory development courses.

Comment on the Literature

The literature on the subject of performance evaluation or appraisal as a means for deriving employee "ratings" or "rankings" for purposes of determining promotability is extensive. Also the journals abound with articles concerning the pros and cons of the summary appraisal interview.[3] This literature is interesting, but did not serve the purpose of this inquiry. Those research studies of employee motivation which centered on the work process were determined to provide the soundest source of data. Also, those works selected to be the major basis of support for the proposition set forth

in this thesis included engineers and scientists among the subjects studied. The studies chosen are reviewed in Chapter II and III.

Limitations of Research

As indicated, this paper seeks performance evaluation ideas which will be of assistance to managers who supervise personnel directly and supervisors in carrying out their day-in and day-out personnel management responsibilities. Therefore, it explores areas of management over which the supervisor has some degree of control. This study will give only as much attention to the more mechanistic features of summary performance rating as is judged to be relevant and necessary for continuity of presentation. Another limitation on the inquiry will be one of an environmental nature. This research will not attempt to deal with all types of positions in all types of organizations. Specifically, it will be limited to consideration of scientist and engineer positions as those being of greatest concern in research and development. Only concepts feasible within existing law and regulation applying to performance rating and evaluation in the government service will be recommended. This latter limitation is considered essential to facilitate a more ready translation of those concepts judged to be applicable into practice considering the complications of regulatory change discussed in Chapter IV.

Methodology of the Study

The methodology of this study is essentially descriptive.

Secondary source materials are used to support the basic position suggested by the thesis. This course of action was chosen after it was determined that there was sufficient research-based motivation study in the area of the R&D professional to justify analysis and give prospect of worthwhile results. This is not to imply that research-based studies of this nature are plentiful; they are not. However, those used in this effort are recognized in the literature as well conceived, quality products.

Consistent with the thesis objective, the approach of the study is to first analyze and evaluate recent work in the field to identify concepts which support structuring performance evaluation as an integrated part of the larger work management process. Secondly, research projects centered on motivation on the job are surveyed to examine the feasibility of attaining employee motivation through the integrated evaluation approach and to obtain ways that it could be used for this purpose if it is a feasible approach.

A number of discussions were held with personnel administrators and supervisory personnel of the National Aeronautics and Space Administration during the period of preparation of this thesis. More specifically, Raymond A. Metcalfe of the office of the NASA Director of Personnel provided valuable information concerning the status of performance evaluation in the agency. The comments of Arthur A. Sanderson, Chief of the Personnel Office, Marshall Space Flight Center and one of his specialists, James Hayes, were useful in getting an

assessment of current use of performance evaluation in that Center. Leslie J. Sullivan, Robert V. Battey, and Charles A. Buckel, all management officials of the Manned Spacecraft Center, were consulted for information regarding performance evaluation practices in that organization.

The performance evaluation plans of NASA, the Marshall Center, and the Manned Spacecraft Center were carefully reviewed as the official policy statements guiding activities in this area, as was the Kennedy Space Center plan. U. S. Civil Service Commission issuances were another source of official information.

The writer also relied on his first hand knowledge of agency and center attitudes and practices, accumulated over a period of some eight years as a personnel specialist with both the Marshall and Kennedy Centers, to assimilate and evaluate the information obtained from the other sources within NASA. This same personal experience base is used in reviewing ideas for potential fit in the R&D environment.

Organization

The first content chapter of the thesis, Chapter II, presents and evaluates several concepts and studies which it is proposed provide support for the proposition that performance evaluation as an integrated, job-centered process can make a positive contribution to the organization and the employee. The effects on performance of management's philosophy toward its employees and the concept of participation are explored at some length and their implications for the thesis are developed.

Chapter III looks closely at the findings of several motivation studies which lend additional support to the main proposition of the thesis and provide further ways that the usefulness of the proposed approach can be realized. Some other factors affecting the work situation are briefly addressed, but are not discussed at length since they are not considered central elements of the proposition as presented by this thesis. Role perception is covered in this chapter as it relates to the orientation of motivated performance. The effects of the organization and group are noted as is the significance of pay and promotion systems.

In Chapter IV, the effects on performance evaluation in the Manned Space Flight Centers of performance rating law, Civil Service Commission and NASA policies and attitudes are reviewed. The Center performance plans and how they are implemented are then critiqued.

The concepts found to be promising in Chapters II and III are then synthesized with some practical considerations to make suggestions for enhancing motivation through the integrated performance evaluation process. The work assignment and review process is used as a framework for this analysis.

The final chapter summarizes the findings of the study and notes some implications for government R&D activities which find themslves in circumstances similar to those described for the NASA organizations in this thesis.

FOOTNOTES

[1]Rayburn A. Metcalfe, "Performance Appraisal: Program of the Past--Process for the Future," (Unpublished staff paper, Personnel Division, NASA, 1966), p. 13.

[2]M. Scott Myers, "Who are your Motivated Workers?" in David R. Hampton (ed), Behavioral Concepts in Management (Belmont, California: Dickenson Publishing Company, Inc., 1968), p. 43.

[3]Douglas McGregor, "An Uneasy Look at Performance Appraisal," Harvard Business Review, XXXV (May, 1957), 89-94; Harold Mayfield, "In Defense of Performance Appraisal," Harvard Business Review, XXXVIII (March, 1960), 81-87.

CHAPTER II

CONCEPTS WHICH FACILITATE THE INTEGRATION OF PERFORMANCE EVALUATION AND THE WORK ASSIGNMENT PROCESS

One of the concerns underlying the proposal of this paper is that performance evaluation, as such, seems to have become synonymous with performance rating in the government service. In Chapter IV, it is shown that the Civil Service Commission and Agency and center levels in NASA stress the need for performance evaluation to be more than a year-end process. The intent of these exhortations is good, but the state-of-the-art of the behavioral sciences is still such that little more has been done to aid the supervisor to integrate performance evaluation in the work management process. The situation of over-emphasis on rating, which has developed over the years, can hopefully be offset by more intense study of the value of the performance evaluation process as an integrated, job-centered process which engages the employee's participation in work assignment planning and review. This chapter analyzes management's philosophy regarding its employees and the effects that this can have on its behavior in supervising them. Employee participation in the decision-making process is then discussed at some length.

A reminder is inserted here that this study is focused on only one facet of the total job of supervising personnel. The reader should keep this in mind so that a proper perspective is maintained concerning the element of performance evaluation as it relates to the "big picture" of personnel management.

Management Philosophy and Participation

The effects of managements' behavior on the actions of the worker were first noted in the 1930's during the Hawthorne Studies conducted by Elton Mayo and his associates at the Western Electric plant in Chicago. These studies are frequently cited as the beginning of the Human Relations Movement which took hold in the 1940's and continues with some force today.[1] Frederick W. Taylor's widely renowned "Scientific Management" served its purpose in analyzing work into its most efficient components and as a result of this tremendously increased industrial production.[2] It was not sufficient as a total management philosophy, however, in that it conceived of the worker with his measured capacity as a functional part of the machine he tended. After the Hawthorne Studies came the "Behavioralists" who took a different view of authority and organization structure from that of Max Weber and the others who saw it from a bureaucratic or top down perspective. Chester Barnard,[3] Herbert Simon[4] and others defined authority as originating with one's subordinates and saw the organization as an "equilibrium" situation in which the members participated only so long as the "inducements" were equal to or exceeded their "contributions." Simon went further in his studies of

man as a decision-maker and concluded that he is only "limitedly rational" and seeks "satisficing" solutions rather than completely rational ones. He basically concluded that man "satisfices" rather than maximizes because he doesn't have the mental capacity to do otherwise. Even if he had the mental capacity, Simon concluded that he still couldn't possibly have all the information concerning alternative solutions needed to make rational decisions as choices present themselves. Simon discredited the "principles of management" approach and opened the way for a deeper more scientific research approach to human behavior in organizations.

In 1954, Peter Drucker said about the human relations movement, "Human relations people helped remove fear as a motivator but did not come forward with positive motivation - other than generalities." Drucker identified other weaknesses of the human relations approach, stating that it " . . . also lacks an adequate focus on work. Positive motivations must have their center in work and job, yet Human Relations puts all the stress on interpersonal relations and on the 'informal group.'"[5] Furthermore, according to Drucker, this approach showed no awareness of the economic dimension of the problem. This paper attempts to "focus on work," however, it also seeks to show the relevance of management behavior to employee effectiveness in the work situation. In this sense, it does not seek to treat management behavior as a prescription in itself, but rather to describe from a research orientation how management's attitude and actions can affect the work of

the individual employee.

Management Philosophy and Performance Evaluation

There is little question that the philosophy which management holds concerning its human resource will indeed influence its behavior, policies, and practices with respect to it. Douglas McGregor shed a great amount of light on this issue ten years ago in his book The Human Side of Enterprise.[6] Behavioral research in management of the past decade has helped remove more of the haze of tradition surrounding this issue.

McGregor presented two theories of management in his book: Theory X - The Traditional View of Direction and Control and Theory Y - the Integration of Individual and Organizational Goals. These are two very different assumptions about human nature and behavior. McGregor used them to show that enlightened management calls for a different philosophy about the work motivations of people (Theory Y) than the traditional assumptions prevalent in management literature and practice (Theory X). Theory X, which he considers a hold-over from tradition and the economic past, is revealed as relying on authority as the sole method of accomplishing organizational objectives through people. These are the Theory X assumptions:

1. The average human being has an inherent dislike of work and will avoid it if he can.
2. Because of this human characteristic of dislike of work, most people must be coerced, controlled, directed, threatened with punishment to get them to put forth adequate effort toward the achievement of organizational objectives.

3. The average human being prefers to be directed, wishes to avoid responsibility, has relatively little ambition, wants security above all.[7]

Research findings and " . . . a growing acceptance of a few rather basic ideas about motivation," according to McGregor, ". . . help to explain the inadequacies of Theory X as well as the limited sense in which it is correct. In addition, they provide the basis for an entirely different theory of management,"[8] the Theory Y assumptions:

1. The expenditure of physical and mental effort in work is as natural as play and rest. The average human being does not inherently dislike work. Depending upon controllable conditions, work may be a source of satisfaction (and will be voluntarily performed) or a source of punishment (and will be avoided if possible).
2. External control and threat of punishment are not the only means for bringing about effort toward organizational objectives. Man will exercise self-direction and self-control in the service of objectives to which he is committed.
3. Commitment to objectives is a function of the rewards associated with their achievement. The most significant of such rewards, e.g., the satisfaction of ego and self-actualization needs, can be direct products of effort directed toward organizational objectives.
4. The average human being learns, under proper conditions, not only to accept but to seek responsibility. Avoidance of responsibility, lack of ambition, and emphasis on security are generally consequences of experience, not inherent human characteristics.
5. The capacity to exercise a relatively high degree of imagination, ingenuity, and creativity in the solution of organizational problems is widely, not narrowly distributed in the population.
6. Under the conditions of modern industrial life, the intellectual potentialities of the average human being are only partially utilized.[9]

McGregor based Theory Y in large measure on Abraham Maslow's work in motivation.[10] Maslow theorized that there were ". . . at least five sets of goals which we may call

basic needs." He found that humans are also ". . . motivated by the desire to achieve or maintain the various conditions upon which these basic satisfactions rest and by certain more intellectual desires." His often quoted "hierarchy of needs," from the lowest to the highest, are briefly defined as physiological, safety, love, esteem, and self-actualization. The relationship of these needs is explained in this way by Maslow,

> These basic goals are related to one another, being arranged in a hierarchy of prepotency. This means that the most prepotent goal will monopolize consciousness and will tend of itself to organize the recruitment of the various capacities of the organism. The less prepotent needs are minimized, even forgotten or denied. But when a need is fairly well satisfied, the next prepotent (higher) need emerges, in turn to dominate the conscious life and to serve as the center of organization of behavior, since gratified needs are not active motivators. . . . The average member of our society is most often partially satisfied and partially unsatisfied in all of his wants. The hierarchy principle is usually empirically observed in terms of increasing percentages of non-satisfaction as we go up the hierarchy.[11]

Using Maslow's theory, McGregor emphasized the finding that a satisfied need is not a motivator of behavior. This is unrecognized in the Theory X and the conventional approach to managing people as he sees it. The lower level needs have been provided for by management, but the McGregor finds that management tends to be fixed in its thinking that these needs and the benefits are the important ones.

> But the fact that management has provided for . . . physiological and safety needs has shifted the motivational emphasis to the social and the egoistic needs. Unless there are opportunities at work to satisfy these higher-level needs, people will be

> deprived; and their behavior will reflect this deprivation. Under such conditions if management continues to focus its attention on physiological needs, the mere provision of rewards is bound to be ineffective, and reliance on the threat of punishment will be inevitable. Thus one of the assumptions of Theory X will appear to be validated, but only because we have mistaken effects for causes.[12]

McGregor's thinking on this subject was based on his experience as a consultant to industry and his interpretation of the research done prior to 1960. He deserves a great deal of credit for focusing attention on the significant effects of management's philosophy of human work motivation on its behavior. He proposed that the way to meet the prepotent esteem and self-actualization needs and organization objectives was through "management by integration and self-control." This kind of management succeeds by ". . . the creation of conditions such that the members of the organization can achieve their own goals best by directing their efforts toward the success of the enterprise."[13]

McGregor has been accused of letting his democratic values interfere with his objectivity in the formulation of Theory Y and his arguments for the need for its implementation.[14] In his defense, democratic values cannot be set aside in consideration of contemporary management philosophy. There is a rather fine balance of organization and individual goals which must be attained by the enterprise (be it private or government) for it to be in tune with the increased emphasis on individual freedom and fulfillment that is evident in our society today. McGregor's work anticipated this. Dwight

Waldo and others have pointed out that this rise of social conscience is likely to be with us for the years to come.[15]

Maslow himself expresses some concern that McGregor may have placed more weight in some of the former's research in supporting his theories than is warranted.[16] He says, ". . . there is insufficient grounding for a firm and final trust in Theory Y management philosophy; but then I would hastily add that there is even less evidence for Theory X."[17] He quickly follows this, however, with the comment that practically all of the research which has been done comes out in favor of Theory Y. In support of McGregor's value bias, Maslow notes that "if democratic, political philosophy means anything at all, then enlightened management can be considered under the head of democratic philosophy applied to the work situation."[18]

It is not the intent of this paper to explore in any depth the subject of values per se; nevertheless, it cannot be emphasized too strongly that they are present and active in all aspects of personnel management including the personnel evaluation process. The values management holds concerning the nature of its human resource are pervasive of all its policy and behavior.[19] This applies directly to concepts of performance evaluation and its purposes and may very well influence how useful this process is in practice as a communication channel between supervisory and employee and a means to definition and accomplishment of organization and individual ends.

McGregor, on close reading, qualified his ideas more carefully than have those who frequently cite him. He recognized

that,

> Perfect integration of organizational requirements and individual goals and needs is of course, not a realistic objective. In adopting this principle, we seek that degree of integration in which the individual can achieve his goals best by directing his efforts toward the success of the organization. 'Best' means that this alternative will be more attractive than the many others available to him: indifference, irresponsibility, minimal compliance, hostility, sabotage. It means that he will continuously be encouraged to develop and utilize voluntarily his capacities, his knowledge, his skill, his ingenuity in ways which contribute to the success of the enterprise.[20]

Support for much of what McGregor said has materialized in the research of Rensis Likert who has developed a systematic theory of management from his own research and that of others at the University of Michigan. Likert's work shows that in the many organizations studied by his group, those that were the most productive, and at the same time had the highest level of employee satisfaction, were those in which "participative management" was approximated. At the risk of grossly over-simplifying, it can be said that the three primary characteristics of this type of management are: ". . . (1) the use by the manager of the principle of supportive relationships, (2) his use of group decision-making and group methods of supervision, and (3) his high performance goals for the organization."[21] Very relevant here is Likert's finding that two of the factors most significantly influencing organization productivity and employee satisfaction were management policy and behavior. He classified these as "causal" variables in his systems approach to organization; these ". . . are independent variables which

determine the course of developments within an organization and the results achieved by the organization."[22] Likert also found that the organizations which are most productive ". . . harness the noneconomic motives with the economic motives."[23]

In summary, it would appear from the research and management literature reviewed in this section that management philosophy concerning the nature of the work force does hold significance for the integration of organization and individual needs. Without an attitude on management's part that the employee is a worthy member of the team having something to contribute to the success of the organization besides the carrying out of directed assignments, it seems that little can be done with the idea of using performance evaluation as a positive process for employee motivation. Though the theory of the employee's needs first developed by Maslow has not been scientifically validated, its general guiding principle has wide acceptance. When man's lower physical needs are satisfactorily met, the evidence is that he does seek to satisfy higher psychological needs. The supervisor can definitely affect the opportunities for this. Likert's work must be used with care in drawing conclusions concerning effects of the individual manager's behavior. His extensive studies do, however, point to a positive relationship between "supportive" management behavior, the productive organization, and a high level of employee satisfaction. High performance goals are also shown to be a characteristic of supervisors of an effective organization.

Participation in Decision-making

In the various concepts discussed, analyzed and evaluated in current management literature and behavioral research, participation of the employee in decision-making appears to stand out as the central theme of modern personnel management. The various writers on the subject do not necessarily agree on a definition of the term, but the concept is generally taken to mean employee involvement in organization decisions which affect his activities on the job (and this is how it is used in this paper). The psychological basis for this idea is the need for the mentally healthy individual to continue to use his given abilities, to grow and develop his potential to the fullest extent. Chris Argyris wrote that organizations tend to work against this natural development of the individual and thereby cause a number of dysfunctional reactions to result.[24]

The interest in participation here is its demonstrated effects on performance. Victor Vroom sums it up this way in his 1965 review of research results available on the subject:

> When the entire pattern of results is considered we find substantial basis for the belief that participation in decision making increases productivity. There is experimental and correlational evidence indicating that higher levels of influence by workers in making decisions that they are to carry out results in higher productivity than lower levels of influence.[25]

Vroom explains the ways in which greater influence in decision-making by employees can increase performance. "It can increase the quality of decisions made, the strength of group norms.

regarding execution of the decisions, and the worker's 'ego involvement' in the decisions."[26] Pelz and Andrews found that both Ph. D's and engineers contributed most when they strongly influenced key decision-makers but also had their assignments influenced by others.[27]

Participation must be conceived of as something more than a desire to manipulate people to achieve higher performance for it to contribute to the long term success of an organization. McGregor states very well the need for participation to have its foundation in a broader management view:

> The effective use of participation is a consequence of a managerial point of view which includes confidence in the potentialities of subordinates, awareness of managements' dependency downwards, and a desire to avoid some of the negative consequences of emphasis on personal authority. . . . It consists basically in creating opportunities under suitable conditions for people to influence decisions affecting them. That influence can vary from a little to a lot.[28]

Also, participation as conceived by this paper does not have to be an "all or nothing" approach. In some ways the concept has moved in this direction by the passage of time. In 1960, McGregor said,

> It is perhaps most useful to consider participation in terms of a range of managerial actions. At one end of the range the exercise of authority in the decision-making process is almost complete and participation is negligible. At the other end of the range the exercise of authority is relatively small and participation is maximum. There is no implication that more participation is better than less. The degree of participation which will be suitable depends upon a variety of factors, including the problem or issue, the attitudes and past experience of the subordinates, the manager's skill, and the point of view . . .[29]

So it is difficult to prescribe a set amount of participation as being "the" proper amount for organizational achievement and individual growth.

Meyer, Kay and French stated among their tentative conclusions resulting from their studies using experimental and control groups of employees at the General Electric Flight Propulsion Division:

> Goal setting, not criticism, should be used to improve performance. One of the most significant findings in our experiment was the fact that far superior results were observed when the manager and man together set specific goals to be achieved, rather than merely discuss needed improvement. Frequent reviews of progress provide natural opportunities for discussing means of improving performance as needs occur, and these reviews are far less threatening than the annual appraisal and salary review discussions.[30]

The large and complex R&D organization presents a different set of problems in participative decision-making than does the smaller more easily integrated research activity. As Herzberg and others have indicated, the need for centralized management and coordination of activities is too great to present the opportunity for true participation at every level in the setting of goals for the work. He says that "to expect individuals at the lower levels of an organization to exercise control over the establishment of over-all goals is unrealistic."[31] Herzberg finds a "reasonable" solution to the problem of motivation through participation of the individual employee in the determination of the "way" goals defined at higher levels in the organization are reached. He envisions that,

> Within certain limits, it is likely that more latitude than is currently available to most people in industry can be given to individuals to develop their own ways of achieving the ends that are presented to them by a centralized authority.[32]

This observation also appears to hold for government.

Likert identifies a high degree of participation by employees in decision-making as one of the key factors characterizing effective firms; however, he finds this attributable to ". . . group decision-making and supervision in an ". . . overlapping group form of structure." This structure has ". . . each work group linked to the rest of the organization by means of persons who are members of more than one group." They serve as "linking pins" between the groups in which they hold membership. In Likert's "macro" view of this situation "Interaction and decision making relies heavily on group processes." "At each hierarchical level . . . all subordinates in a work group who are affected by the outcome of a decision are involved in it."[33] Here again is the need for participation.

One can theorize endlessly concerning exactly how participation functions as a positive factor in worker satisfactior and motivation, but the fact is that it can be seen to work in most situations by the supervisor who uses it intelligently and nothing is more convincing than the first hand experience. There are people, however, who do not react favorably to the opportunity to participate in planning their work assignments. Vroom found in a 1960 study of managers that there was no relationship between the amount of participation in decision-making and job satisfaction or job performance among authoritarian

personalities, but a strong relationship existed for managers low in authoritarianism.[34] One of the reasons given for this reversal is that authoritarian-conditioned personalities have a need for direction from an authoritarian figure and are insecure if treated otherwise. Another exception is the individual who chooses to devote his energies to extra-organizational activities and works only to sustain himself for these other purposes. The literature indicates that the latter reaction is more likely to be associated with the more routine, less satisfying kind of work.

Likert finds that the attitudes of managers and employees can be changed over a period of time in the direction of greate participation if top management wishes to change its management style and actually implements policies and procedures which promote and provide the opportunity for greater participation by all the members of the organization. In this view, once the character of the management of an organization is successfully changed in the direction of greater participation, the balance of the firm will follow in a period of time. This period has not been specifically defined, but Likert's work is beginning to show that some change is evident as early as one year after the managerial changes are implemented.[35]

Implications of Participation for Performance Evaluation as an Integrated Process

Where in the R&D personnel performance evaluation process does the concept of participation in decision-making have relevance? The answer is throughout the process as it is

conceived by this thesis. Just as McGregor saw participation in decision-making as an essential ingredient of management by self-control, this thesis finds some degree of it essential to effective assignment planning, execution and review in the R&D context. The supervisor who desires the greatest contribution from and satisfaction for each of his employees will seek to engage the employee's participation in the work assignment process beginning with the first step, assignment planning. Depending of course upon the nature of the work and the kind of organization, as well as the personality of the individual employee, the R&D supervisor may take any of a range of actions in the assignment planning process. For example, conditions permitting, he will want to assure that research scientists play a large role in formulating their own projects, but a completely free hand is not necessarily the best for the scientist or the organization.[36] In the case of the supervisor of development engineers in a mission situation necessitating that the work be completed within the demanding restraints of dollars and schedules, he can solicit the ideas of his engineers in planning how the goals established by higher echelons can be reached most effectively within these constraints. The nature of the higher level needs of the most productive R&D professionals and the possibilities of reinforcing these needs through supervisor-employee interaction and job communication are developed in greater detail in the next Chapter. Again, there is no set degree of participation that can be prescribed for all cases; the supervisor

and his organization will have to work this out.

Performance evaluation as a motivational process cannot consist of a critical discussion of the strengths and weaknesses of the employee by comparison with job or assignment standards arbitrarily set by the supervisor. Rather, sound performance evaluation begins when the supervisor is assigned a function or project to be completed and he begins the process of determining how the function is to be broken down into employee-sized pieces.

This is the real challenge to the supervisor's ability to manage his human resource in an intelligent and supportive manner. Herzberg's finding that the job itself is one of the prime sources of motivation bears directly on assignment planning.[37] If the "satisfiers" or "motivators," success in job performance and the possibility of professional growth, are to be realized to the fullest extent, participation by the employee in the decisions which shape the assignment appears to be essential. The supervisor who seeks to develop and maintain a high level of motivation among his employees actively considers each individual's capabilities as demonstrated in past assignments before he proposes a new assignment. This helps preclude the obvious failures which often have a demotivational effect on the employee, i.e., where the assignment is too difficult for the employee and even his best efforts are not successful. This may result in a lowering of the employee's aspiration level or rationalizations directing responsibility for his failure to causes external to himself.[38]

As Meyer, Kay, and French show in the results of their study at General Electric, participation in work planning can bring improved employee performance. Discussions of performance progress which center on work goals defined as objectively as possible in advance, were found to have more favorable performance effects than the traditional performance review process.[39]

In summary, participation is shown in this chapter to result from a management point of view which places trust and confidence in its employees. The work of Vroom, Likert, and Meyer, Kay, and French provide support for the idea that employee participation in the decision-making process with respect to work he is to carry out can have a favorable effect on performance. With an attitude on the manager's part which is conducive to employee involvement with him in the assignment planning process, it appears that a major step has been taken with regard to increased employee motivation. The participation process establishes the framework for increasing the employee's ego involvement in his work as noted previously.

The next chapter stresses the critical importance of work itself to high levels of employee motivation. It develops further the basis for the idea that an integrated process of performance evaluation can serve as a vehicle for realizing increased employee motivation through skillful use of the work assignment media.

FOOTNOTES

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CHAPTER III

THEORIES OF JOB MOTIVATION AND OTHER CONCEPTS RELATED TO PERFORMANCE EVALUATION

This Chapter reviews and evaluates selected studies and research which are judged to have relevance to the objective of the paper. The various works included were chosen for their usefulness in providing added support to the proposition that the performance evaluation process, handled as a part of the daily supervisory tasks of assigning and reviewing work, can serve a useful purpose in motivating employees. This Chapter reveals the importance of the job assignment itself as a motivator of behavior.

Law and regulation in the Government service provide for the use of performance appraisals to improve the effectiveness of employee performance. This sounds simple enough and is quite often treated as a matter-of-fact objective in performance evaluation. The underlying assumption seems to be that a good job of performance appraisal will translate fairly directly into improved employee effectiveness on the job. This simple concept, however, turns into a very complex matter indeed when it is examined in the light of current motivation theory. Although the research is far from conclusive, there are a number of concepts being developed which concerned personnel administrators may want to consider now in review of their

performance evaluation programs.

The first section of this Chapter is an overview of the subject of motivation as it relates to work. Subsequent sections review the findings of several authorities in the field. The effects of role perception in the job situation are covered in a third section. Note is also made of organization, group and pay effects. A concluding section will attempt to bring together those elements from the literature which lend support to the thesis.

Motivation: An Overview

Motivated behavior as defined in the literature is voluntary behavior, i.e., behavior performed at will, and motivation is the process which governs voluntary behavior. Psychologists make the assumption that most work behavior is voluntary or motivated.

Victor Vroom in his book, Motivation in Management, indicates that "most contemporary approaches to motivation have their origins in the principle of hedonism." The central assumption in hedonism is that behavior is directed toward pleasure and away from pain. A person selects that course of action from among alternative possibilities which he thinks will maximize his satisfaction and minimize his dissatisfaction. Vroom says that ". . . the hedonistic doctrine had no empirical content and was untestable." Consequently, "the study of motivation by psychologists has largely been directed toward filling in the missing empirical content in hedonism."[1]

Review of the literature reveals that there is fairly

general agreement among psychologists concerning the basic ingredients of a theory of motivation although a large number of different terms are employed. These statements about motives appear to be reducible to statements about preferences among outcomes. Vroom finds,

> Most theories assume that the strength of force on a person to choose a given course of action is directly related to the product of the valence or desirability of an outcome and the expectancy that the course of action will be followed by the outcome.[2]

Psychologists are in agreement that motives are states of tension or disequilibrium produced by events occurring in the external or internal environment of the individual which tend to produce a sequence of actions that persist until the state of disequilibrium has been restored. There is not the same agreement about what causes these states of disequilibrium. Motives are spoken of as short term changes in direction of behavior, i.e., motive arousal, or as secondary or learning motives. Learning motives are longer term, develop as a result of experience and vary greatly among members of a given species, e.g., achievement, affiliation, independence and money.

Ability and Motivation

This Chapter considers performance as motivated behavior, but this is not to imply that motivation is the sole factor influencing an employee's level of performance. Research has confirmed the rather obvious point that there is interaction between ability and motivation in the performance of work. Motivation is very important to effective performance, but

management must first recruit people with the necessary job aptitudes and/or experience or assure essential training is accomplished before motivation becomes a consideration. As Vroom puts it,

> The usefulness of attempts to match the capacities of people with the requirements of their jobs will be dependent on the organization's success in developing a high level of motivation on the part of its members. Similarly, the usefulness of attempts to motivate people to perform effectively on their jobs will be dependent on the extent to which they have the capacities necessary for successful performance.[3]

It is not the intent of this Chapter to delve into the ability aspect of performance to any degree. This is a field in itself. Ability is mentioned here only as a foundation stone upon which motivated performance is built.

Job Satisfaction and Job Motivation

A discussion of the subject of motivation and work would be remiss if it did not comment on the findings of research into the relationship or lack thereof between job satisfaction and job motivation. Well over five hundred research investigations were reviewed and reported on by Vroom in 1964. He concludes from this review that,

> It would seem that measures of job satisfaction are much better predictors of actions toward and away from jobs than they are of the amount of energy that people will exert in job performance. It seems clear that the idea that increases in productivity will necessarily result from satisfying the needs of the employees has little support from existing research.[4]

Frederick Herzberg and others using his methods make a case, based on what their subjects have told them, that performance

is affected by attitudes toward the job.[5] This argument really only getting under way now that more studies using sounder methods are beginning to accumulate. Some of the different interpretations on this issue are covered in the following sections which summarize pertinent aspects of the work of several authorities in the field of motivation and work.

The "Satisfiers" and "Dissatisfiers"

Frederick Herzberg formulated the methodology of his study of attitudes toward work to test the concept that man has two sets of needs, the need to avoid pain and the need to grow psychologically. He structured his study of more than 200 engineers and accountants in the Pittsburg metal industries to meet the objections which are typically made to investigations of attitudes. Some of these objections are: people indicate they have a feeling when they don't, answers people give may not be true indications of feeling but merely rationalizations or displacements, and it is difficult to equate feelings between individuals. Herzberg's research took these steps to meet these objections:

> It included a study of changes in job attitudes in the hope that if attitudes change there is more likelihood that an attitude exists. Further, it focused on experiences in the lives of the respondents which contained substantive data that could be analyzed apart from the interpretations of the respondents. Finally, rather than attempt to measure degree of feeling, it focused on peak experiences and contrasted negative peaks with positive peaks; without being concerned with the equality of the peaks.[6]

The central core of Herzberg's research design was "the notion of the sequence of events as a unit, bounded in time, during which an individual's attitudes toward his job are characterized by himself as being exceptionally positive or exceptionally negative." "Factors-attitudes-effects" were studied as a unitary system within which functional relationships among the components were described. All of these components were derived from the answers given by respondents in a carefully-planned and conducted interview. Job-attitude factors obtained in the interviews were defined as first level if they were an objective element of the situation in which the respondent found a source for good or bad feelings about the job. These included recognition, achievement, possibility of growth, advancement, salary, interpersonal relations, supervision-technical, responsibility, company policy and administration, working conditions, work itself, factors in personal life, status and job security. Second level factors, indicating how the person felt about the event, were analyzed from the respondents answer to the question, "What did these events mean to you?" Effects of job attitudes were analyzed as performance, turnover, mental health, interpersonal relationships and attitudinal.[7]

Five factors were found to stand out as strong determiners of job satisfaction--achievement, recognition, work itself, responsibility and advancement. The last three were identified as being of the greatest importance for a lasting change of attitudes. These five factors appeared very infrequently in

respondent descriptions of events that accompanied job dissatisfaction feelings. Recognition here refers to recognition for achievement. When recognition appeared in a "high" sequence (paralleling a good feeling about the job), it referred to recognition for achievement rather than recognition divorced from any accomplishment. According to Herzberg,

> When the factors involved in the job dissatisfaction events were coded, an entirely different set of factors evolved. These factors were similar to the satisfiers in their unidimensional effect. This time, however, they served only to bring about job dissatisfaction and were rarely involved in events that led to positive job attitudes. Also, unlike the 'satisfiers' the 'dissatisfiers' consistently produced short-term changes in job attitudes. The major dissatisfiers were company policy and administration, supervision, salary, interpersonal relations and working conditions.[8]

Considering the criteria of both frequency and duration of attitude effects, as noted above, work itself, responsibility, and advancement were found to be the major factors involved in producing high job attitudes, but they played an extremely small role in producing poor job attitudes. On the negative side, company policy and administration, supervision (both technical and interpersonal relationships), and working conditions were the major job dissatisfiers with little effect on job attitudes in a positive direction.

The implications of Herzberg's thesis for employee satisfaction are explained by him in this way,

> Theoretically, given an individual operating from a neutral point, with neither positive nor negative attitudes towards his job, the satisfaction of the factors, which we call the 'satisfiers,' would increase his job satisfaction beyond the neutral point. The absence of satisfaction of these factors

> would merely drop him back to his neutral level but would not turn him into a dissatisfied employee. Contrariwise, there should be a group of factors that would act as 'dissatisfiers.' Existence of these negative factors would lead to an unhappy employee. The satisfaction of these factors, however would not create a happy employee. The basic difference between 'satisfiers' and 'dissatisfiers' which operate in only one direction in determining the job attitudes of workers, was one of the hypothesis of our study.[9]

Herzberg indicates that his data revealed that the unidirectional effect was truer of the "dissatisfiers" than the "satisfiers."

The distinction between the factors leading to positive job attitudes and those leading to negative job attitudes is drawn on psychological lines by the author. He observes that the conditions which surround the doing of the job cannot give the employee basic satisfaction. "It is only from the performance of a task that the individual can get the rewards that will reinforce his aspirations." The nature of the motivating qualities of factors defining the job context and those directly related to the doing of the job are found to be essentially different. The factors surrounding the job lead to dissatisfaction if they are not perceived to be at an acceptable level, but when they are increased beyond an acceptable level they do not create much in the way of positive job attitudes. Psychologically speaking the "dissatisfiers" meet avoidance needs or needs to avoid unpleasant situations. Those factors related to the doing of the job itself, the "satisfiers," are associated with self-actualization and individual growth. "In contrast to this motivation by meeting avoidance needs, the job factors reward the needs of the individual to

reach his aspirations." Herzberg conceptualizes the job factor effects as actuating "approach rather than avoidance behavior." He designates these job factors as "motivators" as opposed to the extra-job factors, which he defines as the "factors of hygiene."[10]

> Both kinds of factors meet the needs of the employee; but it is primarily the 'motivators' that serve to bring about the kind of job satisfaction and, . . . the kind of improvement in performance that industry is seeking from its work force.[11]

The relationship or lack thereof between the "motivators" and performance is not of proven cause and effect nature, but it should be observed that Herzberg feels there is a basis in his interview data to claim some relationship.

Interpersonal relations play a negligible role in Herzberg's data. As he indicates, this ". . . tallies poorly with the assumption basic to most human-relations training programs that the way in which a supervisor gets along with his people is the single most important determinant of morale."[12] He advises, however, that supervisory training in human relations is probably essential to the maintenance of good hygiene at work, especially where the job offers little chance for the operation of the "motivators." An overemphasis on hygiene, however, can result in trouble. "It can lead to a greater and greater focus on the extraneous rewards that reside in the context of jobs."[13] Herzberg emphasizes the need to strengthen the 'motivators' to attain positive and lasting motivation.

The "Motivation-Hygiene Concept" developed by Herzberg

in The Motivation to Work has been subjected to criticism by some and supported in subsequent studies by others. In a later book, Work and the Nature of Man, published in 1966, he defends his methodology and cites further verification of it by nine research studies completed since the earlier work. These studies covered 15 different occupations representing a wide range of skills, job levels and types of organizations. In summarizing the results of these studies he shows that the predictions from his theory were wrong in less than 3 percent of the cases. Herzberg also adds that at the time of the writing of the 1966 book more than a dozen other replications were in progress testing the theory on more occupations and organizations. Also a number of studies using variations of methodology have made successful predictions from the theory. He concludes, "the evidence appears to be overwhelming that the nature of job attributes is reflected by the theory first proposed in The Motivation to Work."[14]

One of these studies is of particular interest in that it was conducted over a six year period in a large research and development firm.[15] M. Scott Myers gives a detailed account of the Texas Instruments Incorporated study of 282 employees randomly chosen and representative of their work force including scientific, engineering, supervisory and hourly personnel. Myers depicts the situation which brought on company concern in 1960 as one of decelerated growth after a tremendous ten year expansion when ". . . motivation ceased to be self-generating and became increasingly dependent upon supervision."[16] Although

there is the industry versus government difference to account for, the situation Myers describes could be taken as that of the NASA Centers discussed in Chapter IV.

The results of Texas Instruments' study are consistent with Herzberg's. Some of the more relevant findings follow. Fifty percent of the first level factor high sequences for engineers and scientists related to achievement. In 70 percent of the cases where achievement was the first-level factor, it was also named as a second-level factor. Recognition, work itself, pride and growth were commonly given by respondents as second level factors resulting from achievement.

Texas Instruments' ten-year plan for personnel administration was restructured in 1963 to fit "motivation-maintenance" theory concepts, according to Myers. This corporation recognized that for those who are not naturally effective supervisors, adopting and practicing the motivation-maintenance approach will require "an evolutionary process whereby (1) awareness, (2) understanding, (3) conviction, and (4) habit are developed over a period of perhaps five years."[17] They have instituted a training program to aid in meeting their objectives. An attitude measurement program structured around the motivation-maintenance frame of reference has been instituted to appraise company effectiveness in the six maintenance and four motivation need areas they have identified.

Myers also develops Herzberg's idea that people can be classed as "motivation seekers" or "maintenance seekers." He finds the former ". . . motivated primarily by the nature of

the task and having a high tolerance for poor environmental factors."[18] Maintenance seekers by contrast are ". . . motivated primarily by the nature of their environment . . . are chronically preoccupied and dissatisfied with maintenance factors surrounding the job . . . realize little satisfaction from accomplishment. . . ." Maintenance seekers are cynical toward ". . .. the positive virtues of work and life in general. By contrast, motivation seekers realize great satisfaction from accomplishment and have positive feelings toward work and life in general."[19] Myers remarks that the individual's orientation is fairly permanent but the environment can influence it.

> In a situation of satisifed motivation needs, maintenance factors have relatively little influence either as satisfiers or dissatisfiers. However, the removal of opportunity for meaningful achievement sensitizes the individual to his environment and his perception of maintenance factors becomes colored by a readiness to find fault.[20]

Herzberg reports two findings with respect to performance effects.

> According to the people interviewed, attitudes toward the job exerted an extremely important influence on the way in which the job was done. In over 60 per cent of the combined high and low sequences and effect on performance was reported in the anticipated direction; that is, an improved performance related to improved job attitudes and a decrease in performance related to a change of attitude in a negative direction. The second finding is that the tendency for attitudes to have an effect on performance was greater for favorable attitudes toward the job than for unfavorable ones.[21]

Although the evidence is building in support of Herzberg's concept, it is far from conclusive. He says that due to the lack of meaningful objective criteria it is essential that we

use what clues we have to the impact of attitudes on work behavior. He also acknowledges that due to the nature of his technique his data ". . . should not be considered direct evidence of the behavior of our respondents but rather indications that this behavior had a high degree of probability . . ."[22]

Implications of the 'motivation-hygiene' concept

Herzberg does not prescribe precise methods for increasing motivation but rather indicates this must await further research. He does however specify some goals for increasing motivation. One tentative conclusion he reaches concerning job structure is that ". . . jobs must be structured to increase the maximum ability of workers to achieve goals meaningfully related to the doing of the job."[23] He tentatively concludes, in this connection, that some measure of control over the way the job is performed is necessary for the individual to realize a sense of achievement and of personal growth. It is proposed by this thesis that job-centered performance evaluation is a ready vehicle for reinforcing the higher level needs such as these. This approach calls for the active participation of the R&D professional with his supervisor in the structuring of projects. It anticipates a free exchange of information and support between the supervisor and the professional on a continuous basis with evaluative comments cast in terms of how the project might be improved in the future rather than critical comment on what has transpired.

Another useful idea coming from Herzberg's data is that ". . . achievements in themselves are only a partial reward."

He says, "the accumulation of achievements must lead to a feeling of personal growth in the individual, accompanied by a sense of increasing responsibility." Interesting work is also given as a clue to higher levels of motivation, but it is difficult to predict in advance what will be interesting for a particular individual. Herzberg advises ". . . that the jobs themselves have to be set up in such a way that interest or not, the individual who carries them out can find that their operations lead to increased motivation."[24]

The process of performance rating appears to have the potential of being a "satisfier" by broad application of Herzberg's construction since it can be directed to reinforcing the job content factors. It seems obvious that the nature of its use and its purpose can affect strongly how it is perceived by the employee. As discussed in other parts of this paper, appraisals which focus on personality traits of the employee or are critical in a negative sense are clearly dysfunctional to the objective of motivating the best performance. Then, too, appraisals having a purely administrative purpose with no real perceived value to the employee or supervisor are likewise of little positive motivational value. Thus the findings of performance evaluation research appear also to be explainable in terms of Herzberg's "dissatisfiers" such as company policy and administration (poor lines of communication and harmful personnel policy) and supervision (technical and interpersonal relations).[25] Personality trait oriented and seemingly fruitless administrative evaluations in this

interpretation are not useful in creating employee satisfaction but frequently lead to employee dissatisfaction.

Objectives or results-oriented performance evaluation on the other hand can be interpreted as meeting Herzberg's concept of being a "satisfier." This type of evaluation focused on assessment of work accomplishment and planning for the purpose of assisting the employee to grow in responsibility and skill on the job clearly fits his definition of a "satisfier" (positive job context factor). It is noted that pay was found by Herzberg's studies to have both negative and positive characteristics. Across-the-board raises were "dissatisfiers" whereas pay as reward for performance was a reinforcer of the achievement factor.

The above speculation about performance evaluation is consistent with the position of a number of behavioral scientists that administrative evaluations for rating purposes should be handled separately from appraisals intended to motivate employee satisfaction and effectiveness.

Both Herzberg and Myers draw some conclusions from their studies of the implications of their findings for the supervisor's role. Although their ideas are stated in terms of a broad approach, they can readily be seen to apply to the process of performance evaluation as defined in this paper. Herzberg says of the supervisor:

> He will have to learn discriminatively to recognize good work, to reward this good work appropriately. This emphasis does not reduce the necessity for the maintenance of optimal personal relationships between supervisor and subordinate. In addition,

> he will have to acquire increasingly greater skills in the organization and distribution of work so that the responsibility for successful achievement on the part of his subordinates will be increased.[26]

Scott Myers is able to put his ideas into operational terms based on his experience with the "motivation-hygiene" concept at Texas Instruments. He says the supervisor's role has two parts, to provide conditions of motivation and satisfy maintenance needs.

> In terms of day-to-day behavior patterns, the role of the competent supervisor includes providing each individual with the requisite job information, maintaining high performance expectations, encouraging goal-setting and the exercise of independent judgment, providing recognition and rewards commensurate with achievements, and maintaining an atmosphere of approval in which failure is a basis for growth rather than recrimination.[27]

Myers adds that the supervisor's support in satisfying the maintenance needs (economic, security, orientation, status, social, and physical)

> . . . is essential, particularly so for security and orientation needs. Feelings of security are largely influenced by the supervisor and determine whether the individual will assert himself in a constructive motivation-seeking manner, or will fall back on maintenance seeking behavior. The satisfaction of orientation needs requires supervisors steeped in company lore, policies, procedures, and practices. The ability and willingness of supervisors to dispense information when requested meets a need seldom satisfied by handbooks and other written communications.[28]

Herzberg's findings relating job and job content factors to high levels of employee satisfaction are consistent with the assumption of this thesis that performance evaluation as an employee-job-centered process, which is results and growth-oriented, can serve as a supervisory aid in employee motivation.

In other words, when performance evaluation is a continuous process of information exchange with the employee which permits him to influence his supervisor's decisions in the assignment planning stage, as well as in the progress review stage, it can have a positive motivational effect. This can result if the supervisor uses this process to enhance the subordinate's opportunities for successful achievement on the job as these possibilities present themselves or can be structured into the assignment.

Effective Performance and the Job Climate

In 1966, Donald Pelz and Frank Andrews of the University of Michigan Survey Research Center published the results of a study of scientists and engineers which had spanned more than six years.[29] They were interested in learning what constitutes a stimulating atmosphere for research and development. Questionnaires were administered to in excess of 1300 scientists and engineers in eleven research and development laboratories.[30] Their findings appear to have clear relevance to the thrust of this thesis in that the study was concerned with effective performance and 526 of those questioned were in government laboratories. Of particular interest at this point are their findings in the areas of job satisfaction and motivation of scientific personnel and the implications of these for performance evaluation processes.

Pelz's and Andrews' research was designed to obtain performance data on each scientist through a carefully constructed questionnaire which he completed. Measures of

each man's scientific performance were also obtained which included:

> . . . his scientific or technical contribution to his field of knowledge in the past 5 years, as judged by panels of his colleagues; his overall usefulness to the organization, through either research or administration, also as judged by his colleagues; the number of professional papers he had published in the past 5 years (or in the case of an engineer, the number of his patents or patent applications); and the number of his unpublished reports in the same period.[31]

Adjustments were made in the data to score each scientist relative to others with a similar background. Characteristics of the climate were also obtained on another carefully tested questionnaire. "The two sets of data (on performance and on climate) were analyzed to find those conditions under which scientists actually performed at a higher or lower level."[32]

Five primary analysis groups were used to record the analyzed data. These were: (1) Ph. D.'s in development-oriented labs (half located in government); (2) Ph. D.'s in research-oriented labs (one-third in government); (3) Non-Ph. D.'s in development-oriented labs not dominated by Ph. D.'s, "engineers," (one-quarter in government); (4) Non-Ph. D.'s in Ph. D.-dominated labs, either research or development-oriented, (these were subordinate professionals referred to as "assistant scientists," one-half of them were in government); and (5) Nondoctoral scientists in research-oriented labs not dominated by Ph. D.'s (all in government).

Types of Motives and Performance

One portion of this research investigated three types

of motives, i.e., (1) direction of motivation, (2) source of motivation, and (3) style of approach to work.

Direction or orientation of motives was measured by these criteria: science orientation, professional orientation, status orientation, and career as ladder versus activities liked. Science orientation and the more inclusive version called professional orientation, were "mildly but consistently positive in their relationship to various performance measures." "Interest in status hardly related to performance." Ph. D.'s and engineers in government development labs "seemed more responsive to science or professional motives than did those in industry." Assistant scientists (both industry and government) benefited most from these motives. No strong relationships were shown between the orientation of motives and performance by this data.[33]

Pelz's and Andrews' data reflecting sources of motivation revealed that "independent and self-reliant scientists and engineers were substantially more effective" and dependent individuals were below par in performance. Although effective scientists and engineers reported stimulation from a variety of sources, "the critical element was not the specific source but an underlying factor of intellectual self-reliance--confidence in one's ideas."[34]

As far as style of approach to work went, "interest in a broad rather than a deep approach was a distinct advantage, especially in terms of overall usefulness."[35] Those scientists and engineers with a wide grasp of major new developments and

who did not get caught up in narrow specialities were most useful to their organizations. Ph. D.'s and engineers in government development labs were more strongly affected by breadth of approach and interest in abstract concepts than those in industry.

"Creative tensions"

A key finding of this study from the standpoint of motivation is that self-reliance and independence are important motives to the effective scientist. The R&D supervisor must surely take heed of this finding in the process of performance evaluation. Pelz and Andrews point out, however, that systems of organizational rewards as they typically operate, create dependence on the part of the employee. They say that performance reviews which place the future of the scientist in the hands of one supervisor (although others may superficially enter in the process by signing off on the review) destroy independent thought in the subordinate. A related finding of Pelz and Andrews was that self-reliance and independence did not by themselves make for effectiveness. Effective scientists also interacted vigorously with their colleagues. They contributed most when there was an opportunity to influence those who made the decisions in the organization. A similar combination of conditions of challenge and security emerged from the analysis of the data in other areas as well. In fact, "creative tensions" (so named by the authors), or forces pulling in different directions, were found to be conditions

associated with high performance on the part of scientists and engineers. Thus Pelz and Andrews appear to have added a very significant contribution to the understanding of the job content ingredients associated with effective performance. For years, one has heard about the need for scientists to have independence in their work, and they have on occasion demanded it. Now it appears this was only a part of the motivational picture. This study shows that isolated scientists were not the most effective ones. "'Inner motivation' does not mean isolation from people, but an independence of thought--confidence in one's own judgment."[36] Management's attitude and the consequent presence or absence of participative decision-making in the work assignment and review process obviously can either nurture or frustrate this need.

After further analysis of his data, Pelz published an article in 1967 which clearly sets forth the essence of his findings in a configuration of "creative tensions." A table from that article is included here for the valuable insights it provides into scientists' performance (see Table 1).

Implications of the "creative tensions" idea

Some of the implications Pelz and Andrews draw from their study bear directly on the task of supervising R&D personnel and the process approach to performance evaluation. Considering the importance of self-reliance and the pursuit of one's own ideas, the supervisor can assign work so that the individual subordinate gets credit for this contribution (security), but also he can arrange for the subordinate to explain his work in

TABLE 1.--EIGHT "CREATIVE TENSIONS"[a]

Security	Challenge
Tension 1	
	Effective scientists and engineers in both research and development laboratories did not limit their activities either to pure science or to application but spent some time on several kinds of R&D activities, ranging from basic research to technical services
Tension 2	
Effective scientists were intellectually independent or self-reliant; they pursued their own ideas and valued freedom . . .	. . .But they did not avoid other people; they and their colleagues interacted vigorously
Tension 3	
a) In the first decade of work, young scientists and engineers did well if they spent a few years on one main project...	. .But young non-Ph. D.'s also achieved if they had several skills, and young Ph. D.'s did better when they avoided narrow specialization
b) Among mature scientists, high performers had greater self-confidence and an interest in probing deeply	.At the same time, effective older scientists wanted to pioneer in broad new areas
Tension 4	
a) In loosest departments with minimum coordination, the most autonomous individuals, with maximum security and minimum challenge, were ineffective .	.More effective were those persons who experienced stimulation from a variety of external or internal sources
b) In departments having	

[a]From Donald C. Pelz, "Creative Tensions in the Research and Development Climate," Science, CLVII (July 14, 1967), 160-65. Copyright by the American Association for the Advancement of Science.

TABLE 1.--Continued

Security	Challenge
moderate coordination, it seems likely that individual autonomy permitted a search for the best solution...	. . .to important problems faced by the organization
Tension 5	
Both Ph. D.'s and engineers contributed most when they strongly influenced key decision-makers. . .	. . .but also when persons in several other positions had a voice in selecting their goals
Tension 6	
High performers named colleagues with whom they shared similar sources of stimulation (personal support). . .	.but they differed from colleagues in technical style and strategy (dither or intellectual conflict)
Tension 7	
R&D teams were of greatest use to their organization at that "group age" when interest in narrow specialization had increased to a medium level . . .	. . .but interest in broad pioneering had not yet disappeared
Tension 8	
In older groups which retained vitality the members preferred each other as collaborators...	.yet their technical strategies differed and they remained intellectually combative

meetings of peers or superiors (challenge). This would be consistent with tension 2 in the table. Security can be provided by the opportunity for the scientist or engineer to influence others who decide his assignments, but also, it is suggested by this study that the involvement of others in project determination also serves to add challenge and effectiveness, (tension 5). Regarding specialization, the indications are that the young scientist and engineer did well if he was assigned to a project a few years or long enough to achieve a sense of growth and accomplishment; however, he also should be periodically given second, shorter assignments requiring new skills while he is working on the main assignment. This will provide necessary challenge (tension 3a). Older scientists and engineers, as well as older teams of these types of professionals, tend to become highly specialized and to thereby lose some effectiveness. "Specialization lends security but diminishes challenge." Assignments should be structured to "keep the older man's interest in broad areas strong by tempting him with problems on the pioneering edges of his field." Also refresher courses can be used to add challenge here (tension 1, 3 and 4). In the older group situation, Pelz says challenge it with tasks outside of its area of expertise. Pelz indicates too that older R&D teams ". . . remain productive if they stay cohesive." Yet, while being socially compatible, they were most effective when their technical strategies differed and they remained "intellectually combative" (tension 8). Also, high performers had colleagues

who were supportive but provided a source of "intellectual conflict" or "dither" at the same time by their different technical style and strategy (tension 6).[37]

What does this imply for the supervisor in R&D activities? He needs to consider both the technical and the emotional mix when he reorganizes or forms work groups. He may increase the effectiveness of the younger man and prevent or decrease loss of effectiveness in the older man by using the "creative tensions" concept.[38]

Pelz's and Andrews' results demonstrate very well that technical performance, supervision, and environment are all related. A performance evaluation approach which does not take this into consideration will be indeed lacking. A narrow view of performance evaluation as merely comparison of effort with established requirements misses the real potential of the process for motivating better performance. Evaluation to be a useful process, will have to consider the effects on performance of the nature of the work itself, the interaction of supervisory and subordinate, interaction with other personnel in the organization and without, organization policy and controls and the employee's needs. This requires a removing of the "blinders" that the "rating" view of performance evaluation causes and a realization that there are many factors in the "field" of the work situation that the supervisor needs to be aware of and consider in evaluating employees, if he seeks to maintain and improve organizational and individual effectiveness. Indeed, the supervisor can only do so much

with respect to the many variables that relate to performance, but surely he needs to recognize those things he can and cannot affect and take action accordingly. The role of the supervisor has been downgraded in importance in the large organization setting in a number of ways, but he is still "the" representative of management to most employees. How well he does his job directly affects the opportunities of those under his supervision to contribute and to grow on the job.

The concept of "creative tensions" has brought balance into the picture of conditions the R&D supervisor will want to foster in the interest of building a work environment that appears conducive to effective performance. Job planning by the supervisor which is intended to be consistent with the objective of attaining effective performance cannot concentrate on challenging duties without some thought to security factors and vice versa.

As in the Herzberg study, employee-job-centered factors are important to Pelz's and Andrews' findings. However, their method went further to detail factors present in high performance situations based on performance as rated by peer judgments and objective output measures. The idea of the positive motivation potential of performance evaluation used as a supportive process is consistent with Pelz's and Andrews' work in several respects. The assignment planning and review process is a ready vehicle for structuring into R&D job assignments those factors found associated with effective performance, e.g., coordination, "dither" and diversity elements,

where they have prospect of maintaining or improving employee effectiveness. In this way then, the concept of the evaluation process as a continuous process presents the possibility of reinforcing effective performance and sustaining it.

Other Motivation Factors

Role Perception and Performance Effects

To reiterate, the thrust of this thesis is to seek to undergird personnel performance evaluation as an integrated portion of the personnel management process. Therefore, considerable effort has been directed toward the assessment of behavioral concepts that have growing support in research findings. Much effort has also been made to seek out their relevance to performance evaluation as a process with potential for enhancing organization and individual goals.

A search for major ideas of significance to a proposition may tend to overlook either intentionally or unintentionally (for reasons of focus or possibly sheer volume), lesser points in the literature. This could easily be the case with role perception. Porter and Lawler give role perception an important place in the complex of factors affecting performance. Other sources reviewed gave little emphasis to this idea. Porter and Lawler used the questionnaire method and correlational techniques to analyze the results of a study of the attitudes and performance of 563 management respondents in seven organizations, including an aerospace developer. In addition to the supervisor's response, a rating of his performance was obtained from his superior.

One of the practical implications of their data relating managerial attitudes and performance is a strong indication that

> . . . even when a manager exerts high effort in his job, the resulting performance may be relatively mediocre if his role perceptions are inaccurate. The moral here is that organizations need to consider paying more attention than they have in the past to assessing whether the individual correctly understands where his effort should be applied.[39]

This concept has real meaning to anyone who has experienced capable but poorly directed effort in an organization.

Porter and Lawler studied managers from the first level up in their sample; however, it seems reasonable to assume in the case of their findings concerning role perception that what holds true for supervisors can also be considered applicable for nonsupervisors. These authors point out employers often pay far more attention to attempting to increase the amount of effort that employees exert on their jobs than they do to the direction of such effort. This is in terms of the more psychological aspects of the job rather than technical duties orientation. Their findings

> . . . imply that organizations might be able to improve the overall performance of their managers, without any corresponding increase in the amount of effort required of them, simply by focusing greater attention on role perceptions.[40]

Porter and Lawler do not see this increased attention to role perception (or where the manager's effort should be applied) as leading to undesired conformity on the part of the individual. They see the contrary as indicated, i.e., more rational placement decisions can be made by the organization and more

rational employment decisions can be made by the manager.

The implications of better role perception for strengthening the usefulness of the performance evaluation process are fairly obvious. If the objective of the performance evaluation process is to improve work communications and motivation, then nothing appears more basic than a careful delineation by the supervisor of what is important in the job he desires an individual to perform. A good possibility exists that greater attention to where the subordinate's effort should be concentrated or clarification of relative priorities in the participative assignment planning process will preclude problems that may occur later in the performance review process, due to misunderstanding. This approach entails a dual responsibility in the assignment planning stage. The supervisor cannot pass the buck to the subordinate to figure out what the superior wants and subsequently pass judgment on the subordinate for guessing wrong. Priorities and basic direction are the task of the supervisor. The subordinate also will have to assume greater responsibility for listening closely for the "where" portion of the assignment and if it is not forthcoming, raise the question. Two cautions seem appropriate here. The supervisor will have to use care to avoid turning the "where" emphasis of the assignment into how to carry it out, if he desires to leave that initiative with the employee. Secondly, in R&D work the "where," or direction of an investigation, may itself be the assignment and of course this qualifies the above concept.

The Organization and the Group

Without a doubt, the nature of the organization in which the supervisor is located has tremendous effects on his actions in evaluating performance. Golembiewski describes the "substantial costs" incurred by the functional organizational structure (narrow span of control) commonly employed in government compared with the product organization (broad span of control). Where the broad span of control organization is in effect, the size of the "managerial entity" is shown to be smaller, supervisory power is increased and job enlargement is more feasible. All of these of course facilitate the management job. Another advantage that can accrue from the more ideal organization is a structure which ". . . encourages 'general supervision,' i.e., monitoring performance in terms of results with considerable freedom for the employee so long as he is performing up to standard." Since under the product (broad span of control) organization units under one supervisor may be organized around a complete product, Golembiewski sees the task of motivating and measuring performance as considerably eased. He says that relative measure of performance between units is possible whereas the more hierarchical organization must rely on performance standards. Some fairly obvious training advantages are also pointed out for the product organization.[41]

As important as organization structure is to the supervisor, this is a factor that frequently is beyond his control. Therefore, consistent with the emphasis of proposing practical

assistance to the supervisor, the main effort here is not an organizational one.

The informal group influence is another element that can affect the performance of the individual employee. Vroom summarizes this factor as follows:

> . . . the cohesiveness of a group affects the amount of influence that it can have on its members but it has no necessary relationship to productivity. Whether the direction of a work group's influence is consistent or inconsistent with the objectives of the total organization is dependent on its norms; that is, the particular behavior patterns which are met with approval or disapproval by group members. Clearly, a person's motivation to perform his job effectively is influenced by his relations with his co-workers. Two aspects of these relations appear to be involved--the extent to which he likes or admires his co-workers, and his conception of how they think he should behave. He is likely to invest a great deal of energy in the performance of his job when he is attracted to his co-workers and when he believes that they will be more likely to accept him if he does so.[42]

According to the results of a study conducted by M. Patchen in 1962, "quite strong relationships" were found between the performance norms of a group and the supervisor in charge of the group.

> A supervisor who strongly encouraged efficiency on the part of his subordinates and who, at the same time, was perceived as 'willing to go to bat' for them when the occasion demanded it, tended to have a group with high performance norms.[43]

Those supervisors with the opposite of these attributes tended to have groups with low performance norms. Likert also found the combination of supportive behavior and high performance goals in the manager's behavior associated with high performance units.[44]

Pay and Promotions

In the government R&D environment, there are two other factors that directly affect performance evaluation over which the supervisor has only limited control, pay and promotions. The limits result from a government-wide position classification system and organization competitive promotion policies.

Government organizations, especially as they mature, can develop rather rigid organization and position structures which in turn result in restriction of promotion opportunities. Instead of the seemingly unlimited opportunities for advancement that were present in a dynamic and growing organization, employees and supervisors are confronted by a fully-staffed hierarchy with rather firmly drawn grade structures. Monetary reward according to the federal government position classification system usually follows organizational level with great regularity.

There have been improvements in the pay and reward system and in the technique for classifying scientists' positions since Golembiewski wrote his criticism of the Civil Service work management system in 1962.[45] Pay reform actions have brought Civil Service pay schedules more closely in line with industry rates for similar work, beginning in 1962. Within-grade increases for high quality work were authorized also beginning in 1962. Also some very significant developments have taken place in the position classification area in the past ten years. A "Research Grade Evaluation Guide"[46] (position classification standard) has been issued which permits credit

for individual contributions and allows all individual professionals to reach the full grade level possible in the particular research function performed. This "rank-in-the-man" concept is conducive to individual effort, as is the "man-in-the-job" concept which is now a possible grading consideration under Civil Service Commission position classification policy. The latter concept recognizes that a man can by his own unique abilities and contributions develop his position beyond the grade level normally appropriate for the particular kind of work and provides for upgrading of the position in such cases.

These improvements in the reward system are important factors in work motivation in the Civil Service. Supervisors of R&D activities cannot be expected to motivate high performance and maintain job satisfaction without at least an adequate reward structure. It is speculated that adequate to the R&D professional means pay reasonably comparable to what his acquaintances in other R&D organizations who do similar work receive.

The idea being developed here is that pay is a motivator and a potent one when skillfully administered. There have been arguments downgrading the importance of pay but they have not been convincing. Vroom reports

> . . . the level of performance of workers is related to the extent to which performance is instrumental to the attainment of higher wages, promotions, and acceptance by co-workers. In each case this relationship is strongest for workers who most strongly value each of these outcomes.[47]

Herzberg makes a distinction between money as a direct reward for outstanding individual performance and money as an across-

the-board increase. The former he found to be a reinforcement of the motivators, recognition and achievement, and the latter a "dissatisfier."[48] Porter and Lawler report in their recent study, ". . . When raises are viewed as signifying progress in work or as rewards for good performance, pay is seen as a satisfier of a number of needs."[49] The most recent evidence then indicates that how pay is handled may determine its motivational effects. This means that the organization and the supervisor can encourage high performance through actions which base raises on individual contribution, but they will need also to provide ". . . adequate feedback about raises so that each individual can evaluate the significance of his raise."[50]

Peter Drucker adds the necessary perspective to the argument by bringing forth the fact that there are limits to the number of promotions an organization can make. Speaking of manager personnel, he said:

> Overemphasis on promotion frustrates and demoralizes three or four out of every five management people. It also leads to the wrong kind of competitive spirit in which a man tries to get ahead at the expense of his fellow workers.[51]

However, this problem is by no means confined to the managerial structure. In government R&D activities, as in other areas of government, there is only so much that can be done with pay. Judicious use of pay and promotions applies most directly at the lower grade levels of the pay schedule where the engineer or scientist still has promotion room. This means that the supervisor who normally controls promotions through the "full performance" or "journeyman" level has the pay motivator

available to use in combination with other factors to motivate high performance among the younger professionals. This is not the case with the mature and experienced scientist or engineer. If he has reached the top of the applicable pay schedule, then he can only be awarded special monetary awards for outstanding performance. So long as there is reasonable pay comparability in the salary schedule, it is not likely that the older professional will leave his job. There is also no assurance that he will continue to be productive. Thus the noneconomic motivators that reside in job content become extremely important as a resource to the supervisor.

Summary of Relevant Concepts

Performance has been viewed as motivated or voluntary behavior in this chapter. The fairly obvious point is made that motivated behavior must be combined with the necessary degree of ability in a job for there to be effective performance.

The motivation theory of Frederick Herzberg is analyzed in some detail and the "satisfiers" or job content factors of work itself, responsibility and advancement are found to be of the greatest importance to a lasting change in a favorable direction of employee attitudes toward their work. However, the major "dissatisfiers" of company policy and administration, supervision, and working conditions can cause dissatisfaction if they do not receive necessary attention along with the positive motivation factors. The critics of this theory point to the fact that it is based on the psychological responses of employees with the weaknesses inherent in such a method.

However Herzberg counters that the responses obtained can be taken as indicating a high degree of probability that the behavior described occurred and that it is essential that we use what clues we have to the effects of attitudes on work behavior. The details of the findings of Herzberg, M. Scott Myers, and others using their approach are less important to the proposal of this paper than the major trend of their findings, that the factors associated with positive work attitudes center on the job itself rather than job context factors that continue to receive a disproportionate amount of management's attention.

Pelz's and Andrews' findings regarding the job factors associated with the most effective R&D professionals lend added support to the idea that a continuous process of employee performance evaluation can be a useful device for enhancing employee motivation. It can do this by concentrating on job and assignment factors which affect the doing of the job and influencing these in such a way as to create or sustain motivation for the employee. Pelz's and Andrews' analysis reveals that a tension factor is present in work motivation which appears to be an essential consideration in creating a climate in the laboratory which will reinforce effective performance.

Since the job factors studied by Herzberg, Pelz and and Andrews and others can readily be affected through a coninuous process of performance evaluation, it would appear it receives further support as a useful vehicle through which

the supervisor can influence employee motivation.

Other elements of the performance picture discussed in this chapter were role perceptions, organization and group effects, and pay and promotion considerations. The role perception idea makes it clear that performance may be improved by focusing attention on the desired outputs of a job without any added effort being required of the employee.

Organization and group effects on the performance of employees will need to be recognized by the supervisor for the powefful factors they can be. Although these are factors which are not typically subject to his control, he can influence the group norms in the direction of productive goals by his own behavior according to studies reported. Patchen and Likert are two that find supervisors of the more productive work groups have high performance goals themselves and are also supportive of their subordinates.

Although the supervisor may not have the pay or promotion tools available as an incentive to use to motivate high performance levels among the middle-aged professionals, he can use the assignment and review process to detect where the possible use of the noneconomic motivations will promote employee and organization goals of achievement and can build desirable "tensions" into the assignments of his employees. If pay is used to motivate performance, it must be given as a visible reward for good performance to accomplish its purpose according to studies cited in this chapter.

The next Chapter develops further some ideas of why and how the supervisor can motivate the achievement of organization and individual goals through use of the participative work assignment and review process.

FOOTNOTES

[1]Victor H. Vroom, Motivation in Management (American Foundation for Management Research, Inc., 1965), p. 8.

[2]Ibid., p. 10.

[3]Ibid., p. 32.

[4]Ibid., p. 33.

[5]Frederick Herzberg, Work and the Nature of Man (Cleveland: The World Publishing Company, 1966).

[6]Frederick Herzberg, "The Motivation-Hygiene Concept" in David R. Hampton (ed), Behavioral Concepts in Management (Belmont, Calif.: Dickenson Publishing Company, Inc., 1968), pp. 36-37.

[7]Frederick Herzberg, Bernard Mauser, and Barbara Block Synderman, The Motivation to Work (2nd ed.; New York: John Wiley and Sons, Inc., 1967), p. 28.

[8]Herzberg, Work and the Nature of Man, p. 72.

[9]Herzberg, The Motivation to Work, p. 111.

[10]Ibid., p. 114.

[11]Ibid., p. 114.

[12]Ibid., p. 115.

[13]Ibid., p. 131.

[14]Herzberg, Work and the Nature of Man, p. 128.

[15]M. Scott Myers, "Who Are your Motivated Workers" in Hampton (ed), Behavioral Concepts in Management (Belmont, Calif.: Dickenson Publishing Company, Inc., 1968), p. 43.

[16]Ibid., p. 43.

[17]Ibid., p. 64.

[18]Ibid., p. 47.

[19]Ibid., p. 48.

[20]Ibid., p. 63.

[21]Herzberg, The Motivation to Work, p. 87.

[22]Ibid., p. 84.

[23]Ibid., p. 132.

[24]Ibid., p. 134.

[25]Herbert H. Meyer, Emanuel Kay and J. R. P. French, Jr., "Split Roles in Performance Appraisal," Harvard Business Review, XLIII (February, 1965).

[26]Herzberg, The Motivation to Work, p. 136.

[27]Myers, "Who Are your Motivated Workers," p. 63.

[28]Ibid., p. 64.

[29]Donald Pelz and Frank Andrews, Scientists in Organizations (New York: John Wiley and Sons, 1966).

[30]The numbers and locations of these personnel were: 144 scientist-professors in seven departments of a large midwestern university; 641 scientists and engineers located at five industrial laboratories; and 526 research personnel in five government laboratories.

[31]Donald C. Pelz, "Creative Tensions in the Research and Development Climate," Science, CLVII (July, 1967), 160.

[32]Ibid., p. 160.

[33]Pelz, Scientists in Organizations, p. 96.

[34]Ibid., p. 104.

[35]Ibid., p. 108.

[36]Ibid., p. 104.

[37]Pelz, "Creative Tensions," pp. 160-165.

[38]Ibid., p. 165.

[39]Lyman W. Porter and Edward E. Lawler, III, Managerial Attitudes and Performance, (Homewood, Ill.: Richard D. Irwin, Inc., 1968), p. 175.

[40]Ibid., p. 175.

[41]Robert T. Golembiewski, "Civil Service and Managing Work: Some Unintended Consequences," in Golembiewski and Frank Gibson (eds), Managerial Behavior and Organization Demands (Chicago: Rand McNally and Company, 1967), p. 285.

[42]Vroom, Motivation in Management, p. 40.

[43]Ibid., p. 40.

[44]Rensis Likert, The Human Organization: Its Management and Value (New York: McGraw Hill, Inc., 1967), p. 53.

[45]Golembiewski, "Civil Service and Managing Work," pp. 273-295.

[46]United States Civil Service Commission, "Research Grade-Evaluation Guide," Position Classification Standards (Washington, D. C.: U. S. Civil Service Commission, 1964).

[47]Victor Vroom, Work and Motivation (New York: John Wiley and Sons, Inc., 1964), p. 266.

[48]Herzberg, "The Motivation to Work," p. 117.

[49]Porter, Managerial Attitudes and Performance, p. 176.

[50]Ibid., p. 177.

[51]Peter F. Drucker, The Practice of Management (New York: Harper and Row, 1954), p. 153.

CHAPTER IV

PERFORMANCE RATING LAW, POLICY, ATTITUDES, AND THE CENTER PLANS

It was indicated in the first chapter that the thrust of this paper is to identify performance evaluation concepts having potential for use by Kennedy Space Center (KSC) supervisors in a daily operations context. These supervisors, like most other Federal Government supervisors, are subject to applicable law and higher echelon policy and regulatory controls in the exercise of their personnel management responsibilities. Law and regulation establish definitive requirements and constraints that to a large degree shape the formal processes of performance evaluation at the installation level. For this reason, the Performance Rating Act of 1950, as amended (the Act), United States Civil Service Commission (USCSC) and NASA policy and regulations affecting performance evaluation are discussed at this point.

In this chapter, as in other chapters of this paper, the term performance rating refers to the periodic summary rating of performance which all Government supervisors are required by the Act to make for each of their subordinates. Whereas performance evaluation is used to denote the continuous process that a supervisor goes through in appraising the work of each subordinate. The latter is considered as a part of

the day-to-day process of planning and establishing work requirements and objectives; communication of these to the employee, review of work progress against established criteria and subsequent planning action as indicated by the review.

U. S. Civil Service supervisors subject to the Federal Merit System are called upon to make periodic summary performance evaluation judgments for a number of different purposes besides the annual performance rating. Specifically, KSC and other Government supervisors are required to make assessments of their employees' performance in the following cases: (1) ninety days after an employee is first appointed to or is reassigned to a new position to determine if placement is satisfactory; (2) ten months after an initial appointment to recommend if an employee shall be retained or separated from the Service; (3) at the time an employee is eligible for a within-grade step increase in order to certify that his performance is or is not at an "acceptable level of competence"; (4) to support various awards such as "Quality Step Increases" for high quality performance and "Sustained Superior Performance Awards" for superior performance; (5) as required by merit promotion plan regulations in connection with an employee's application under a promotion announcement; and (6) to serve as the basis for adverse personnel action proposed for reasons of inefficiency in job performance.

These evaluations range in complexity from a simple certification in the case of the ten-month appraisal and within-grade step determination to a very specific and detailed

statement of factual reasons as is required by law and regulation in adverse actions. The "ninety-day follow-up" on performance and the merit promotion evaluation consist essentially of a factor checklist and provide for a narrative statement as well. Awards such as the "Quality Step-Increase" and "Sustained Superior Performance" require a comparative statement detailing how performance has exceeded job requirements.

The above serves to make the point that performance evaluation is directed to many purposes in the government. However, the major concern in this paper is with the effects of performance evaluation structured as a continuous process in the supervisor/subordinate work relationship. The following section on the Performance Rating Act depicts its effects in this relationship.

The Performance Rating Act of 1950, as Amended

The literature on performance evaluation indicates federal government offices were some of the first users of performance rating techniques in the United States beginning around 1850. Several different laws and amendments to laws concerning performance rating were passed during the span of years since rating was first employed. In 1950, the most recent change, the Performance Rating Act, was enacted. The Act was intended to rectify some of the ills that had beset performance rating prior to the time of its enactment.

Selected sections of the Act are quoted below to indicate its intentions and scope. Section three states the purpose of required rating plans:

> For the purpose of recognizing the merits of officers and employees, and their contributions to efficiency and economy in the Federal service, each department shall establish and use one or more performance-rating plans for evaluating the work performance of such officers and employees.[2]

And Section 5 elaborates:

> Performance-rating plans required by this Act shall be as simple as possible, and each such plan shall provide
>
> (1) that proper performance requirements be made known to all officers and employees;
> (2) that performance be fairly appraised in relation to such requirements;
> (3) for the use of appraisals to improve the effectiveness of employee performance;
> (4) for strengthening supervisor-employee relationships; and
> (5) that each officer and employee be kept currently advised of his performance and promptly notified of his performance rating.[3]

Section 6 of the Act specifies the ratings to be used:

> Each performance-rating plan shall provide for ratings representing at least (1) satisfactory performance, corresponding to an efficiency rating of "good" under the Veteran's Preference Act of 1944, as amended, and under laws superseded by this Act; (2) unsatisfactory performance, which shall serve as a basis for removal from the position in which such unsatisfactory performance was rendered; and (3) outstanding performance, which shall be accorded only when all aspects of performance not only exceed normal requirements but are outstanding and deserve special commendation. No officer or employee shall be rated unsatisfactory without a ninety-day prior warning and a reasonable opportunity to demonstrate satisfactory performance.[4]

Section 7 of the Act provides for an impartial review of a performance rating to be made by a department on request and written appeal to a board of review, including the right to a hearing and a decision on the merits of the appealed rating.

Under Section 8 of the Act, the USCSC is authorized to

issue such regulations as may be necessary for the administration of the Act. They are also charged with the responsibility to inspect the administration of departmental performance rating plans to determine compliance with the Act. In conjunction with this, the USCSC is authorized to revoke its approval of a plan not meeting the requirements of the Act and to prescribe a plan for use by the department.

United States Civil Service Commission

In addition to its own experiences with performance rating accumulated over the years, the USCSC has the recommendations of two Hoover Commissions to consider. These recommendations suggested a positive use of performance information in developing employee performance and limiting of the use of this kind of information for other purposes. O. Glen Stahl, former Director of Policies and Standards for the USCSC, writes that the first Hoover Commission,

> . . . urged that 'ability and service records' be used only for supervisory-employee conference, with a view to developing employee performance, and not to govern salary increases, layoffs, or dismissals. The second Hoover Commission followed this up with further urging that only exceptional performance--the kind demonstrating promotion potential, misplacement, meritorious recognition, or need for dismissal--be formally reported, with the appraisal and motivation of the mass of employees left to the day-to-day supervisor-employee relationship. A rating system 'should not be an end in itself.'[5]

The USCSC has not been successful in its efforts to change the Act as documented by Dr. Husain Mustafa in an informative article in the Civil Service Journal.[6] He states that the USCSC is not happy with the Act and has not been

since it was first passed. Mustafa found that, "much disenchantment with the Federal rating system is traceable to the restrictive features of the Act and the meaningless requirements that it imposes." The "restrictive features and meaningless requirements" of which he speaks include: the provisions that agency plans include certain required features and be approved in advance by the USCSC; the mandatory use of adjective summary ratings; and elaborate appeal procedures provided by the Act. Mustafa cites the administrative complications of assigning an "unsatisfactory" rating plus the possibility of a reversal through the appeal process as reasons why this rating is little used. The requirement that all aspects of an employee's performance must be outstanding for an "outstanding" rating limits greatly the use of this category. As a result of these kinds of rigidities, almost all employees are rated in the satisfactory category.[7]

The attitude of government supervisors toward the rating system imposed by the Act is rather clearly expressed in a USCSC press release. In connection with its efforts to get Congress to abolish the Act's requirements for adjective summary ratings and USCSC approval of agency plans, the USCSC released a statement in 1959 which referred to the Act as the ". . . widely criticised law that has resulted in 97% to 99% of all employees being rated satisfactory . . ."[8] Furthermore, this comment by a USCSC representative while testifying before a Congressional committee in 1960 fairly well sums up the attitude of the Commission toward summary

ratings,

> . . . performance ratings are not notably effective in improving the quality of employee performance on the job; they are not effective aids to deciding personnel actions on the basis of merit; and they are often dismissed by employees, supervisors, and management people as mere red tape.[9]

In 1960, the USCSC proposed a bill to Congress which would provide agencies more flexibility in developing their own evaluation systems. It incorporated recommendations,

> (1) Abolishing adjective summary ratings that represent fixed rating levels,
> (2) Untangling performance evaluation from adverse personnel actions,
> (3) Abolishing statutory boards of review in favor of an impartial agency review, and
> (4) Dropping advance Commission review of plans.[10]

These efforts to change the Act were not successful. Mustafa attributes this failure to a combination of reasons, some political, i.e., appeal would create a "legislative vacuum" and employee union opposition, and some practical, i.e., more behavioral research is needed to confidently back up proposals for change. According to Mustafa, these circumstances have contributed to a ". . . shift in Commission strategy from an all-out effort in favor of appeal, to 'living with the Act' and promoting increased flexibility within the existing legal framework."[11]

Several personnel developments are credited by Mustafa with having an even more significant effect on the USCSC's attitude toward the Act. He says these developments have ". . . enabled agencies to deal with employee performance effectively without being handicapped by the restrictive features of the Performance Rating Act."[12] The availability

of the following tools has supposedly relieved some of the restrictions of the Act; the award provisions of the Incentive Awards Act of 1954, the "quality step increase" and "acceptable level of competence" provisions of the Salary Reform Act of 1962 and use of the regular adverse action procedures in lieu of the "unsatisfactory" rating to discharge incompetent employees. Incentive awards have been used by agencies instead of the "outstanding" rating causing it to lose much of its significance. The "quality step increase" and "acceptable level of competence" provisions as construed by Mustafa, have added, ". . . a new category . . . near each end of the performance continuum." "There is no question that this broadening of the performance scale permits clearer distinctions and has great merit in terms of motivation and reward." Also performance evaluation has been untangled from adverse personne action as a result of court action and USCSC advice to the agencies to use adverse action procedures in lieu of the "unsatisfactory" rating route to discharge incompetents.[13]

An introductory comment to Mustafa's article states that he is perhaps more generous to Federal personnel institutions than they deserve, and this appears to be the case. A patchwork of various provisions pulled in from here and there can hardly serve as an intelligible guide to performance rating in the Federal service. An example of the insufficiency of his position can be cited from the KSC experience with the "acceptable level of competence" provisions which are said by Mustafa to broaden the performance scale. Appeal procedures

were added to this "tool" within several years of its implementation. These expanded appeal procedures effectively placed a determination of "nonacceptable level of competence" in the same cumbersome category with the "unsatisfactory" rating as far as appeal levels are concerned. In the writer's opinion, this significantly reduced its usefulness to supervisors. R&D supervisors are even more reluctant than other supervisors when it comes to "red tape."

Dr. Mustafa indicates that the Commission's recognition of the limitations of the concept of an all-embracing appraisal system to serve the differing requirements of promotability, employee development and improvement in employee-supervisor relations is reshaping its attitude toward performance rating and discussions. Research in motivation and human relations and some of the newer methods such as problem-solving approaches, mutual goal-setting and employee self-rating are having a growing influence on Commission thinking. According to Mustafa, ". . . the emerging trend in performance evaluation is to 'depersonalize' appraisal by freeing supervisors from the burden of evaluating employees as individuals." This approach calls for the evaluator to review products, processes, roles and progress toward objectives consistent with ". . . a growing awareness that attempts to measure and evaluate character and personality traits are more difficult and less meaningful than efforts to measure aspects of job performance."[14]

In its implementing instructions to agencies, the Commission attempts to convey the message that there is more

to performance appraisal than the annual assignment of a summary rating. Its instruction makes the distinction this way:

> The performance rating, itself, is the supervisor's periodic, official summary of his evaluation of an employee's performance. But performance evaluation is not a periodic process; it is the supervisor's continuing, day-to-day responsibility.[15]

Otherwise, its instruction adds little new substance to the Performance Rating Act requirements. It does spell out the detailed procedures needed to implement performance rating plans consistent with law and offers some guides for establishing effective performance evaluation programs.

In summary, and as indicated above by Mustafa, the USCSC has apparently adopted an approach of "living with the Act" and promoting increased flexibility within the existing legal framework. This course of action may have been the only reasonable one the USCSC could take in the face of a Congress unwilling to change the law, but it has not really helped the supervisor in the field who is still required to comply with the provisions of the law.[16] The thrust of this thesis is in the direction recommended by the second Hoover Commission, i.e., appraisal and motivation of the mass of employees through the day-to-day supervisor-employee relationship. The Hoover Commission's recommendation that only exceptional performance (good or poor) be formally reported is also compatible with the proposition of this thesis.

National Aeronautics and Space Administration

Rayburn Metcalfe indicates in a staff paper he prepared on performance appraisal in NASA that performance evaluation

received little emphasis as a program in the first few years of the Agency's existence.[17] In these early years, the component elements of the Agency were small enough that individuals making outstanding contributions were well known and recognized for their particular competence. Incentive awards were little used and there was no requirement that standard appraisals be made when an award was proposed. Each NASA installation had its own method for evaluating its employees for promotion. The legal requirements of the Performance Rating Act of 1950 were minimally satisfied by the Agency performance rating plan which provided that employees be issued pre-printed notices indicating that their performance was satisfactory. Metcalfe states that "'Outstandi or 'Unsatisfactory' ratings were seldom if ever assigned, and only then when a supervisor violently objected to the issue of the satisfactory cards and went to a great deal of trouble to justify one of the other ratings."[18]

In 1962, at the suggestion of the Administrator, the NASA Director of Personnel initiated a project to develop an improved agency-wide performance appraisal program. This program was to provide a system for measuring performance and a plan to assist and guide supervisors in developing and improving the performance of their employees. The underlying assumptions of this project were:

1. That a performance appraisal instrument (or group of instruments) could be developed that would produce reasonably valid and reliable measures of employee performance.
2. That a single performance appraisal and reporting

system could be developed that would satisfy all performance evaluation needs as well as external legal and regulatory requirements; and

3. That such a uniform system could be implemented agency-wide.[19]

A plan was developed over a period of some fifteen months. Comments were obtained through visits to several NASA field installations. However, the concerns of the specialists who prepared the proposed plan were confirmed when the concensus of opinion from the field was that the plan should not be implemented. The most consistent objections to the proposed plan were:

1. The detail and complication of the reporting system;
2. The formal nature of required appraisals and discussions;
3. The inflexibility or inappropriateness of mandatory reporting forms; and
4. Deriving numerical scores from performance reports for summary evaluation purposes.[20]

A decision was made by NASA not to implement the proposed system. Subsequently the Agency sought and obtained USCSC approval for a revised NASA Performance Rating Plan to replace the one on file with them at that time. The revised plan, as approved, provided additional flexibility to NASA field installations. The more important new features incorporated in the plan are: (1) authority is delegated to the installations to develop their own plans within the broad guidelines of the agency plan; (2) appraisal instruments and techniques are optional; (3) the importance of holding frequent informal superior-subordinate discussions concerning position requirements and work objectives is stressed, in addition to the required annual performance review, as indicated in this excerpt from

the plan:

> In addition to the required discussion of performance ratings, supervisors are to have frequent, less formal discussions with their employees throughout the rating period as a part of their normal work planning and evaluation. It is at these times that supervisors are to make sure that their employees understand their duties and responsibilities and are fully aware of the work objectives and what is expected of them. These discussions are not to be handled as a perfunctory obligation. They should be a genuine effort to increase employee effectiveness through improved communications and relations.[21]

NASA installations were free to devise or adapt appraisal methods appropriate to their local needs so long as they stayed within the broad guidelines of the Agency plan. Management officials indicated to NASA Personnel Division representatives, when the revised plan was implemented in 1965, they were pleased with its broader flexibility though they were not satisfied with all current practices.[22]

The Agency's position as expressed in this plan was sound and reflective of the mood of its field installations at the time. Jobs were getting done and schedules were being met or slipped for good reason. NASA's work force was a comparatively young and highly motivated one. Mission objectives were clear (especially for the moon-bound Manned Space Flight effort), opportunities for individual growth were plentiful and a word of appreciation for a job well done was usually sufficient.

However, depending upon one's point of view, all was not necessarily well in the installations' implementation of the NASA plan and their own sub plans. As noted by Metcalfe in 1966, there was a continuing need for more effective

guidance for Agency managers to improve work communications and appraisal techniques.[23] This assessment was based on supervisory and employee opinions expressed during personnel program reviews.

It should be emphasized at this point that the several innovations which NASA incorporated in its revised performance plan were approved by the USCSC. This response by the Commission can be taken as evidence of its interest in providing agencies greater freedom to experiment in the adaptation of performance evaluation techniques to the requirements of local activities. However, the initiative came from the Agency.

Metcalfe cites a number of guides for NASA future program activities involving performance appraisal. Three of these are quoted to show the direction of the Agency Personnel Division's thinking on performance evaluation:

1. To encourage the clear definition of appraisals in terms of specific objectives, and the use of methods and techniques most appropriate for each.
2. To place primary emphasis on efforts to increase individual and group effectiveness through improved performance and work communications, rather than appraisal per se;
3. To stimulate the development of appropriate appraisal and performance improvement methods at the lowest organizational level possible;[24]

The Performance Rating Act of 1950, as amended, clearly serves to create restrictions and inflexibilities in the government performance rating process. The narrow view of performance evaluation prevalent in the Federal service may very well have some of its roots in the restraining regulatory provisions of the Performance Rating Act of 1950. The USCSC

has attempted to obtain more flexibility for the agencies to establish performance plans more suited to local needs. Congress declined to change the law in 1960, apparently for political reasons and due in some measure to the inability of the USCSC to make a good case for a new approach. Making a good case will be difficult without more and better research in behavioral science.

NASA has had its own trials and tribulations with performance rating and evaluation. Some false starts at attempting to develop a "cure all" system of performance evaluation to serve all purposes have been rejected by the Agency. The current Agency plan represents the results of NASA's experience and provides as much flexibility to Agency field centers as NASA could find in the Act and USCSC regulations.

The second Hoover Commission was concerned that the "rating system should not be an end in itself," but performance rating still colors very strongly the idea of performance evaluation in the Government and the Agency. NASA is making some progress in moving from emphasis on appraisal per se to emphasis on improved performance and work communications within the constraints of existing law and regulation.

Performance Evaluation in the Manned Space Flight Centers

This section begins with a brief summary of the functions of the Office of Manned Space Flight (OMSF) field centers. It then comments on the R&D work situation as this has implications for the supervisor. Relevant features of the

center performance evaluation plans are reviewed, and, lastly, the situation is critiqued from the standpoint of possible application of the integrated process approach to employee evaluation in the NASA, OMSF field centers.

The Manned Space Flight Field Centers

The three NASA field installations of the Office of Manned Space Flight are: the John F. Kennedy Space Center, the Marshall Space Flight Center and the Manned Spacecraft Center. Their roles in the manned space flight effort complement each other and together, it can be said, they are the team which, along with certain headquarters elements of NASA, plans, designs, and carries out our manned missions in space. More specifically, the Marshall Center is responsible for the design, manufacture, and ground test of the launch vehicle. The Manned Spacecraft Center is charged with responsibility for the design, manufacture, and test of the spacecraft, astronaut training, and mission control. The Kennedy Space Center is responsible for the design, manufacture and test of launch equipment, and the assembly, pre-flight checkout, test, and launch of space vehicles (integrated spacecraft and launch vehicle). These are generally the missions of the three centers and are precise enough for the purposes of this paper.

Each manned mission is highly complex and requires the participation and support of hundreds of contractors employing thousands of personnel. All of these centers evolved by design into technical management functions, as the major Apollo lunar mission was prepared, beginning in the early 1960's.

Although each center continues a certain amount of "in-house" design and development (and some research), the primary effort is the planning, direction, coordination, review, and evaluation of contracted functions.

The Work Situation

From the brief description given of the functions of the Manned Space Flight Centers, it can be seen that their activities are highly complex and require demanding technical coordination mechanisms.[25] Albert F. Siepert, former Deputy Director of the Kennedy Space Center, succintly expresses the need for management control in the development organization.

> In a basic research organization, the direction of an individual scientist becomes a delicate and personal thing. The casual contacts with his chief - who presumably has equal or superior technical qualifications to understand and appraise his work - will determine the extent to which the 'control' is exercised as a loose or relatively tight rein.
>
> The situation changes a bit where development rather than basic research, is the predominant creative function. Only as an organization takes on the coloration of a development enterprise does the opportunity and the requirement for topside managerial direction become evident. Here there arise factors of funding, scheduling and hardware performance criteria. These involve many operating elements within the organization. Management controls become necessary to integrate a complicated project and keep each part in phase with everything else.[26]

James E. Webb, Administrator of NASA during the stress-laden period leading up to the successful Apollo moon landing, assesses some of the implications of the NASA type of R&D activity for supervision in the following passage from his book:

> In the large-scale endeavor we must have the orderliness and stability necessary for precision and continuity in operations. We cannot have key executives going off in directions of their own choosing and making their own rules as they go. On the other hand, we must have work habits and procedures that will foster innovation, for without innovation we cannot possibly organize to accomplish these large, complex and demanding jobs.[27]

The organizational requirements for control cited above have an effect on the whole nature of the enterprise. More specifically, in the area of immediate concern, the supervisor-employee relationship, the leeway for originality in project planning is less than that available in the pure or applied research laboratory. But, the rigorous requirement for coordination itself presents opportunities for contact and colleague stimulation that is not as characteristic of the pure research environment.[28] With this picture of the organizational environment in mind, the discussion of the performance evaluation in the NASA field centers is resumed.

The Performance Evaluation Plans

Performance evaluation plans formally in effect in the OMSF field centers reflect the requirements of the Performance Rating Act and higher echelon policy.[29] All three centers have exercised the delegated authority to develop their own plans. None have elected to specify detailed appraisal procedure requirements for supervisors, but procedures are prescribed for satisfying the annual rating requirement of the Performance Rating Act. Along with providing the steps to be followed for compliance with the Act, the procedures echo

the NASA policy statement, "in addition to the required discussion of performance ratings supervisors are to have frequent, less formal discussions with their employees throughout the rating period as a part of their normal work planning and evaluation."[30] The three plans have, in effect, added very little of policy substance to the NASA performance evaluation policy framework and are in fact quite similar implementing instructions.

It is not necessary for the purposes of this study to attempt a detailed comparison of the center procedures since they are very similar in approach. However, it may be useful to review a few of the procedural steps they require for the purpose of showing the mechanistic orientation that performance rating takes at the field level.

For this purpose, the Kennedy Plan can be taken as typical of the three. The mandatory rating requirement is satisfied through the use of a pre-printed notice which informs the employee that he has been rated satisfactory. Supervisors are reminded ninety days before the rating anniversary date that they must initiate steps at that time if they propose to rate any of their subordinates other than satisfactory. The plan itself spells out the procedure to follow in this eventuality. If the supervisor takes no action upon receipt of the notice that annual ratings are due, the personnel office automatically distributes a "Notice of Official Performance Rating" to him for each of his employees. This notice, in the form of a printed IBM card, is issued in conjunction with the annual performance review and discussion which the card

requires the supervisor to hold with the employee. Several of these centers encourage the supervisor to discuss the rating with the employee by requiring that one copy of the notice be certified by him and the employee, indicating that a performance discussion has been held, and this copy be returned to personnel for record purposes. This constraint was imposed on the supervisor as a reaction to criticism received in a Civil Service Commission personnel program review which indicated that performance rating discussions were not being held with some employees.

One innovation warrants mentioning. The Manned Spacecraft Center has used since 1965 an "Employee Performance Appraisal" orm which is prepared in duplicate (employee's copy and supervisor's copy) when a satisfactory rating is assigned. "This form is intended to provide an evaluation of the most important attributes of employees who are assigned "satisfactory ratings."[31] Each attribute is rated according to one of three possible phrases: A. - Exceeds normal requirements, B. - Meets normal requirements, or C. - Needs improvement. If the "needs improvement" rating is chosen for an item, it is to be documented on the reverse of the form. The qualities being rated are defined on the form for rater and employee understanding. Fourteen general qualities are listed and provision is made for the supervisor to add rating factors which he considers relevant. Space is provided for strong points to be elaborated on as well as areas "where improvement would be most profitable" and for comments.

The rating plan requires the original of the form be given to the rated employee at the time of the performance discussion and the duplicate copy is for retention by the supervisor. This innovation by the Manned Spacecraft Center is apparently well received by the supervisors of that center, according to an unpublished study which had some impact in revision of the form in 1967.[32] The form is intended to serve a fourfold purpose: (1) to permit greater depth and attention to the evaluation of employees in the broad area of "satisfactory"; (2) to inform the employee of the extent to which he was meeting his supervisor's expectations or work demands; (3) to serve as a topic outline for the confidential interview between the employee and supervisor; and (4) to have a greater impact on the employee's efforts to improve his performance.[33]

Supervisory practices training sessions are used to convey the requirements and procedures of the performance evaluation plans to new supervisors, and segments regarding performance evaluation are included in refresher courses for all supervisors. The information available on these courses indicates a procedural orientation similar to that included in the performance plans.

A general observation on the character of the OMSF field center performance rating programs is that they satisfy the law. With the exception of the Manned Spacecraft Center's use of a performance appraisal guide, there is little evidence of action to go beyond the requirements of the law. This is really not surprising; contacts with a cross-section of

Government officials confirm that this kind of treatment of the rating process approaches being the rule rather than the exception, especially in technical activities. Scientists and engineers are notorious for their ability to ignore or give only cursory attention to the administrative processes fomented by those "who don't really comprehend what the mission is all about." Their technical orientation generally brings with it a distain for administrative detail and frequently administrators as well. Four pre-requisites for a professional listed by William Kornhouser all center on technical competence.[34]

Wesley L. Hjornevik indicates that the Manned Spacecraft Center has been guided in its development by several basic principles. It has tried to ". . . operate in a manner conducive to both professionalism and the attainment of mission objectives." Three principles applied to this end include: "the matrix organization - the overlay of programs across functions" necessary for multiple program management; decentralization of responsibility to key officials; and in-house laboratory facilities which provide the opportunity for independent research by government scientists.[35] Leslie Sullivan reports that the Manned Spacecraft Center employed the lateral coordination mechanism, described by Likert characteristic of the effective organization, in handling the immense coordination problems of Project Apollo.[36]

These or similar devices have been used to some degree in the other two OMSF field centers while carrying out their responsibilities for integrating the complexities of Apollo,

but the details of this are not known at this time. However, lateral coordination similar to that described by Likert bas been achieved through intercenter boards, panels, and working groups involving the OMSF and other NASA centers.

It would appear that these centers, while giving less than first priority treatment to the requirements of administrative procedure in personnel performance rating have employed technical management approaches compatible with the concept of a process approach to performance evaluation.

Much more needs to be known about the management activities of the OMSF centers before generalization is possible. However, according to Likert's concept, the ability to function in the lateral coordination configuration is an indication that management attitudes are toward the "participative" end of his systems continuum.[37] If this is the case, the climate should be conducive to employee development as well as organizational goal facilitation through a process approach to employee evaluation. This approach may help cope with some of the goal motivation loss that was mentioned in Chapter I.

Summary of Program Status

To summarize, this chapter reviews the legal, policy, and regulatory setting of performance evaluation in the government in general and in NASA activities. It shows that NASA has followed a course of granting its field centers a high degree of flexibility in developing performance evaluation plans

which are required by the law. An examination of the three OMSF center plans reveals that the formal plans themselves, while satisfying legal and regulatory requirements, go little beyond those requirements. However, there are a number of indications that a work-centered approach to evaluation may receive more ready acceptance than a "rating" approach to employee evaluation. All of the OMSF centers have participated successfully in an elaborate "lateral coordination" system of informal, intercenter panels, boards, and working groups during the Apollo Project. According to Likert, this is some evidence of the capacity to function in a "participative" management configuration. Sullivan finds the Manned Spacecraft Center used the lateral coordination mechanism fairly extensively to accomplish the difficult task of managing Apollo Spacecraft development and mission planning. This kind of organizational flexibility can be viewed as providing the basis for reasonable speculation that the OMSF centers provide a climate for a more substantive approach to performance evaluation than the "rating" approach which is only tolerated.

The next chapter proposes some ideas for achieving improved motivation through performance evaluation as an integrated, continuous phase of the work management process.

FOOTNOTES

[1]Public Law 81-873, (1950).

[2]Ibid., sec. 3.

[3]Ibid., sec. 5.

[4]Ibid., sec. 6.

[5]O. Glen Stahl, Public Personnel Administration (5th ed.; New York: Harper & Row, Publishers, 1962), p. 262.

[6]Husain Mustafa, "Performance Rating Revisited," Civil Service Journal, IX (April, 1969), 29-31. This article gives a rather unique insight into the USCSC attitude toward performance evaluation.

[7]Ibid., p. 29.

[8]U. S. Civil Service Commission, "Press Release," Washington, D. C., August 11, 1959.

[9]Mustafa, p. 29.

[10]Ibid.

[11]Ibid.

[12]Ibid.

[13]Ibid., p. 30.

[14]Ibid., p. 31.

[15]U. S. Civil Service Commission, Federal Personnel Manual (Washington, D. C.: U. S. Government Printing Office), Chapter 430, para. 1-4.

[16]The writer's first hand experience with the Act at the field activity level during the period Mustafa cites is that the restrictions of the Act have not really been softened to the degree he seems to think they have. My observation is that the USCSC "strategy" is so subtle and cautious that it has not sifted down through the bureaucracy in a meaningful way.

[17]Rayburn A. Metcalfe, "Performance Appraisal: Program of the Past--Process for the Future," (Unpublished staff paper, Personnel Division, NASA, 1966). Metcalfe's paper is the main source for this section on Agency level performance appraisal experience and attitudes.

[18]Ibid., p. 9.

[19]Ibid., p. 10.

[20]Ibid., p. 11.

[21]NASA, Federal Personnel Manual Supplement No. 13, para. 2-3, d(7).

[22]Metcalfe, p. 13.

[23]Ibid., p. 13.

[24]Ibid., p. 22.

[25]Leslie J. Sullivan, "Utilizing Lateral Organizational Patterns in a Research and Development Function: Mission Planning for Manned Space Flight" (Unpublished dissertation, University of New Mexico, 1970). See for some penetrating insights into this mechanism as it evolved at the Manned Spacecraft Center.

[26]Albert F. Siepert, "Creating the Management Climate for Effective Research in Government Laboratories" in Karl Hill (ed), The Management of Scientists (Toronto: S. J. Reginald Saunders and Co., Ltd., 1964), p. 88.

[27]James E. Webb, Space Age Management (New York: McGraw-Hill Book Company, 1969), p. 146.

[28]Wesley L. Hjornevik, "Guiding Work Relationships among Scientific, Engineering and Administrative Professionals" in Issues in Public Science Policy and Administration: A Symposium (to be published in connection with the Program for Advanced Study in Public Science Policy and Administration, The University of New Mexico), p. 25.

[29]John F. Kennedy Space Center, NASA, "Employee Performance Evaluation Plan," KMI 3430.1, Kennedy Space Center, Florida, 1966; George C. Marshall Space Flight Center, NASA, "Performance Rating System," MSFC Personnel Manual, Part 4, subpart 2, Marshall Space Flight Center, Alabama, 1960; and Manned Spacecraft Center, NASA, "Performance Rating System," MSCM 3000, Part 4, Subpart 2, Manned Spacecraft Center, Texas, 1965.

[30]NASA, Supplement No. 13, para. 2-3, d(7).

[31]Manned Spacecraft Center, "Performance Rating System," para. 4.210-1.

[32]Max Higgs, "A Study of the NASA-MSC Employee Performance Appraisal Program" (Unpublished staff paper, Manned Spacecraft Center, 1966), p. 17.

[33]Ibid., pp. 5-6.

[34]William Kornhouser, Scientists in Industry: Conflict and Accommodation (Berkeley: University of California Press, 1962), pp. 195-196.

[35]Hjornevik, "Guiding Work Relationships," pp. 17-25.

[36]Sullivan, "Utilizing Lateral Organizational Patterns."

[37]Rensis Likert, The Human Organization (New York: McGraw-Hill, Inc., 1967), pp. 156-188.

CHAPTER V

A SYNTHESIS OF CONCEPTS AND PRACTICE

Chapters II and III reviewed a number of research-based concepts each of which is considered to have value in assessing the usefulness of performance evaluation practices and more specifically, in helping structure the performance evaluation process as an integrated part of the R&D supervisor's job. This chapter examines these concepts within a standard supervisory pattern of work assignment and review and also considers additional concepts drawn more directly from performance evaluation studies. The objective of the chapter is to make some suggestions compatible with an integrated performance evaluation process which have some basis in research as well as practice.

An effective supervisor would not think of beginning a project with a review of how well it has gone. In fact, this does not even make sense, when so stated. Ironically enough this quite frequently occurs in the traditional approach to performance evaluation. The emphasis on how the employee is progressing comes to the fore when the system says that it is time for the performance rating. If the supervisor has not put some serious effort into evaluating his employees before this time, he may well avoid the responsibility with a few pleasant words or even worse may slip into irrelevant criticism

of personality traits which has given the whole process a bad name.[1]

Ratings for administrative purposes are considered by this thesis to be necessary in some form as discussed earlier, especially in large organizations.[2] This is not the argument here. The need diagnosed in order to enhance employee motivation through the performance evaluation vehicle is to shift the emphasis from performance evaluation for end-result rating purposes to handling of it as an integrated facet of the supervisor's continuing management functions.

Based on the review of the literature, comments from personnel practitioners within NASA, and R&D supervisors, it is proposed that the planning and organizing of the work, that the supervisor does well in advance of the evaluation stage, has not received due attention nor has employee performance review in the daily operational context. These are times when the supervisor can turn the evaluation process into a positive experience that can benefit both the organization and the employee by making use of the potent intrinsic motivation potential of work itself. The review is important; it tells both the supervisor and the employee how they have done during a particular period of time or on a particular project. Nevertheless, if it is handled in such a way that it alone is supposed to improve performance or is perceived in this way by the employee, as it appears to be all too often in rating-centered systems, then much of its potential for motivating performance has been missed or misdirected.

This chapter makes some suggestions concerning how balance can be established in performance evaluation so that it can help meet organizational requirements and individual needs through focusing on the job, the factor which brings the organization and the employee together and largely determines if they stay together.

Assignment Planning and Discussion[5]

The intent of this section is to take a closer look at the assignment process as a vehicle for enhancing work motivation and to suggest ideas for promoting work-centered motivation based on the concepts reviewed in Chapters II and III and the practical experience of the writer.

The typical R&D supervisor who has the normal mix employees of various ages will have to consider more than economic motivators as an incentive to attain organizational goals and individual satisfaction and motivation to work. There are several approaches to this issue. The supervisor may supervise from a philosophy based on democratic values and agree with the behavioralist findings that the job itself affords high levels of intrinsic motivation (see Chapters II and III). If he does not necessarily see eye-to-eye with the behavioralist approach, he will very likely need to look for some other ideas if he wishes to maintain a productive unit. Studies show very clearly that the performance of the typical R&D professional peaks in the age range of forty to fifty and then drops, ". . . but less among inner-motivated scientists and those in development labs." In coping with this drop

in effectiveness the more authoritarian supervisor may resort to the dismissal threat with the older R&D professional if he does not produce, but under the government merit system separations are not easy to accomplish. Average performance ordinarily assures retention. Clearly this is a serious problem which requires intensive study on a priority basis.

Besides supportive behavior on the supervisor's part and efforts to assure effective interaction among members of the work group, the job itself can provide part of the answer for the R&D supervisor who wishes to do what he can to promote individual and as a consequence organizational effectiveness.

The Work Assignment Process

Before considering some steps that the supervisor can take to enhance employee motivation in the work assignment phase of the performance evaluation process, it should be stated they represent a practitioner's efforts to synthesize some of the implications of the behavioral research reviewed with the work flow as it may occur in the R&D environment. The proposals represent a bias toward the development side of R&D since that is where the writer's experience lies and it is anticipated that some of the suggestions will be most useful

Another introductory comment is also in order. Much more sound data appears to be direly needed concerning the complex and subtle interaction that takes place between man and his job. A more favorable attitude toward trying some of the concepts being tested on the part of those in a position to do so will no doubt be invaluable to progress in developing

ideas with apparent potential for improving personnel management practices.

Position descriptions vs. the whole job

In government R&D work a job comes into being when the supervisor commits his idea of what needs to be done into writing as a position description. This document must first serve to justify whatever grade level the supervisor seeks for the position. Position descriptions currently must conform to so many administrative purposes in the government that they may very well be of little practical use as a guide to the uninitiated concerning what is expected of him on the job.[4] If the supervisor is to cultivate the kind of favorable performance evaluation possible, he will need to begin here in the job planning stage. Regardless of position description policy, the employee needs a clear and direct explanation of what his job is and what kind of results are expected of him on the job. The position description is not intended to and does not sufficiently do this job.

The supervisor who conceives of the job to be done in terms of the results expected by him as these relate to the functions of his organization will be prepared to convey to the employee not only what the job is, but where it fits in the scheme of things. This presents the opportunity to the employee to understand his work environment and increases security feelings which help to balance the tensions that employees feel about their jobs. During the assignment phase is also the time to clarify role perceptions concerning which

duties are primary in the job.

Understanding the employee

One of the first responsibilities of a supervisor is seeking an understanding of each of his employees. Due to the uniqueness of individual value systems and perceptions, it is too much to expect that the supervisor will be successful in acquiring a complete understanding of any employee. Also, the supervisor's own values and perceptions may work counter to his desire to develop greater insight into the needs of his people. However, without a sincere interest and continuous effort in this area, it is not likely that the superior will develop and maintain the frame of mind that is essential to creating opportunities for the employee to grow on the job. Close listening to what an employee says and observation of his behavior in the work environment can help one get insight into his interests and strengths. These can be taken into consideration in planning his work to make as constructive use of them as is possible within the work situation.

The arguments go both ways concerning how much a supervisor is capable of doing, and in fact will do, on an individual basis in this area. The advocates of an organizational approach to the problem see the efforts of the individual supervisor as being directly affected by the reward structure of the organization. From an economic standpoint, he must insure that his subordinates are adequate to their present jobs, but few organizations reward supervisors for developing their personnel up and possibly out of the organization.

> With just so much time and effort available, the superior will be inclined to do that which enhances his own standing in the organization and ignore that which does not.[5]

In this view, unless the management philosophy of the organization considers employee development on the job an important part of the supervisor's job and rewards him for it, little is likely to take place. This makes good sense, but it seems to swing the pendulum too far in the direction of the predominance of the organization over people. It gives no relief to the individual supervisor who sees the long run benefits to the employee and the organization of an approach that has an orientation supportive of individual as well as organizational growth

The position of this thesis is that unquestionably the attitude of top management and the organization it structures set limits within which a supervisor functions but placing too much weight on this side of the argument does not give due recognition to the higher level needs and values of supervisors themselves. Granted that the nature of the R&D occupation as compared with more routine work requires different attitudes on the part of the effective professional, which have been defined as being at the higher level of the human need structure as it is now conceived, it seems rather inconsistent to say that economic motives prevail once he becomes a supervisor

In light of the advancing social values of our society and the disposition of R&D personnel toward self-reliance and independence, it seems reasonable to hold to the position that the individual R&D supervisor has and will continue to motivate

development of his employees on the job. As McGregor saw it, change in the direction of greater concern with individual development can and has begun at levels in an organization lower than the top.[6]

Questions from the employee

Another factor which is critical to job planning is the opportunity for the employee to question the supervisor concerning any aspect of the job, or assignments made within the context of the job, which he does not understand. This seems very basic, but human nature being what it is, the more retiring employee will hesitate to ask questions unless there is sincere encouragement to do so on the part of the supervisor. There is a natural tendency for the busy supervisor to forget that the employee (especially the new employee) will need to learn many things which have long since become automatic and therefore taken for granted as being "common sense" by the experienced supervisor. The discussion concerning the importance of role perceptions in Chapter III applies here also.

Learning on the job

Research on the job climate associated with effective scientists and engineers confirms the psychologists' position that unless many employees are to become obsolete by occupational changes calling for new skills, management will have to take positive steps to preserve the "learning attitude."[7] There are strong indications that this cannot start too early in the R&D professional's career. The young scientist needs to

develop specialized knowledge in his first two or three years of work. His current and future effectiveness, however, will be enhanced by assigning him secondary work of less time consuming nature than his primary assignment, causing him to learn a second and possibly even a third speciality.[8] This same research suggests that he may even benefit from a mild exposure to the administrative tasks of the organization. In the interest of organizational effectiveness and the individual employee's career, individuals and groups can be encouraged to tackle both research and application problems.

It is during the day-to-day work discussions between the supervisor and employee that real job learning can take place. The "threat" of appraisal that can make the formal summary type of appraisal dysfunctional is not present. The emphasis can be on the performance results and suggested steps for improving performance at the time when the learning opportunity is optimal, i.e., immediately after completion of the task or assignment.[9] The crucial nature of the timeliness of this kind of review as opposed to the annual summary evaluation to development of better performance cannot be overstated and is a supporting factor to the proposal of this thesis. Experimental findings show that immediate feedback brings the best learning results whereas employees become more prone to reject criticisms as these increase in number.[10]

Participation in work planning

This topic was covered in some detail in Chapter II as

one of the key concepts underlying the proposal of this thesis. It is brought in here primarily to place it in an operational context.

Meyer, Kay, and French have conducted and reported on rather extensive studies of performance evaluation at the General Electric Flight Propulsion Division. As a result of their studies, they stressed the importance of these findings which support employee participation in the work planning process and a continuing process of employee evaluation:

> Performance improves the most when specific goals are established . . .
> Coaching should be a day-to-day, not a once-a-year, activity.
> Mutual goal setting, not criticism improves performance
> Participation by the employee in the goal-setting procedure helps produce favorable results.[11]

The employee may have little to contribute in an assignment planning session but conveying the idea that his thoughts are solicited will help initiate an open-minded approach to his work.

The supervisor's task in connection with promoting employee involvement as early as possible in the work planning stage is to critically analyze the task or project to determine those aspects which appear most conducive to positive contribution by the employee. To repeat, this is a matter of degree in most cases, depending for example on the extent the particular assignment may have to be completed as a part of and coordinated with a larger task and schedule. At any rate, in a discussion preceding the initiation of the project the supervisor can engage the performer's judgments concerning

task accomplishment. The advanced thought the supervisor gives the job will prepare him to elicit comments in certain areas of the assignment, but of course, this is not intended to limit employee suggestions regarding other assignment elements. It may even be a good idea if time permits, and in fact may be necessary in some cases, to suggest that the employee think further about the assignment and the session be resumed at a later time.

Some pure research situations and some development situations will permit a maximum degree of participation, including participation in actual project determination, whereas in many R&D situations the problem is to carry out projects determined at higher levels in the organization. In the latter case, the employee's participation can be focused on how requirements can best be met within allocated resources.

During the assignment formulation stage the supervisor can take steps to insure the employee's continued development on the job by working into the assignment some of the "creative tensions" discussed at length in Chapter III above. For example, he can integrate into the work assignment the opportunity and, if need be, the requirement for coordination and communication with other professionals and organizational elements within and outside of the immediate function, especially in the loosely coordinated work situation. This will also insure the activation of another important stimulant, an awareness on the part of the professional of other professionals' activities, interests and problems.[12]

Stretching the man with the job

For those researchers or engineers who have not reached the top grade possible in their career ladder, a "stretch" may be a useful approach in assignment planning. When an employee seems to have fairly well mastered the level of work appropriate for his grade level, he can be discretely given assignments of greater challenge and complexity normally considered to be higher grade assignments. This is one way to encourage growth and continued learning, so long as the assignments are kept within reasonable bounds, and it is made clear to the employee that this cannot decrease the mandatory time-in-grade promotion requirements of the regulations. This is accepted practice when it is done in the last few months preceding an employee's eligibility date for career promotion, but what is being said here is it can be used anytime after the first ninety days of the initial appointment from a competitive register. So long as the time element for higher grade work is kept to 20 percent or less of the employee's work time, there is no problem with regulations. Care must be taken that the assignments are not too difficult for the employee, but handled skillfully this technique may help retain a promising employee who might otherwise be lost to the organization because of unnecessarily rigid adherence to the system. Of course a detail to another position may also serve a useful purpose as well as some job rotation, but if these are to foster development they must be of sufficient length to provide real learning opportunity.

Job perceptions

The importance to effective performance of the employee accurately perceiving the priorities of various elements in his job or assignment was reviewed in Chapter III. It will suffice here to suggest that the supervisor can confirm the accuracy of the employee's perceptions through the "play back" he receives from him in the job discussion process that precedes the initiation of the assignment. In this manner, the prospect of a favorable evaluation on an assignment is enhanced since whatever motivation the employee has to perform well can be channeled most directly to where it is needed.

Performance Standards

Regardless of the purpose of the performance evaluation, there needs to be some kind of criteria against which progress can be appraised. This element of the performance evaluation process is indeed a difficult one, especially for professional and managerial positions where the results of the work effort may be quite intangible and subject to great variation.

The Performance Rating Act requires that performance requirements be made known to employees and that performance be fairly appraised in relation to such requirements. Performance requirements are the responsibility of the supervisor in the typical Government R&D activity. Civil Service Commission regulations do not require the standard to be in writing except where an official personnel action is proposed which must be supported by written job requirements. In the several Federal R&D activities with which the writer is familiar the

parent agencies also have a flexible policy on recording of job standards.

Management by objectives

The old standby performance characteristics of quantity, quality and manner of performance do not apply readily to the research and development task, which by its nature usually involves some new variables or new combination of known variables. George Odiorne who is a supporter of "management by objectives" has this to say about the problem:

> The major requirement for using industrial engineering techniques to set standards of performance is that there be a beginning and an ending to the work cycle or task, and output related to measurable effort. This isn't true of technical and professional work since we are measuring responsibility and results, not effort, . . . often the cycle in technical, professional, managerial, and staff work is such that it never repeats itself; or it may be a year or two in length. . . . In view of repeated failures to measure the performance of managers on conventional time-study or engineering-work lines, it is evident that some new methods of measuring individual managerial and professional performance are called for.[13]

Odiorne's prescription for dealing with this problem entails a system of goal-oriented management. The total concept of management by objectives described by Odiorne extends beyond the scope of interest of this paper since performance appraisal is only a subsystem within his construction. Also, the elements of financial risk and profit seem to be essential ingredients of the larger concept he promotes. Nevertheless, the main emphasis in this concept has direct application to a performance evaluation process which is job-centered rather than trait-centered. At the heart of the objectives system

is the idea that the individual performance of a manager is definable in terms of results measured against goals established for his function. His goals are established consistent with major organization goals and those of other managers directed toward the same organization goals. There is participation by the manager in goal-setting and decision-making related to his functions.

A similar approach can be taken in an organization with respect to individual assignments for professional scientist and engineer positions. Although risk and profit are not factors in the sense that they are in industry, cost and schedule often are. The latter two factors may not apply as directly in pure research situations, but both of them are present in development projects. How well a project engineer or scientist accomplishes assignment goals within cost and schedule (which he has agreed to in the planning stage with his superiors or a larger project team) can be used, and is used, with discretion as one criterion of performance.

Results-oriented appraisal

The contribution of the objectives concept to the approach proposed in this paper is its focus on goals and results. Centering on goals and results achieved in terms of the goals helps remove some of the subjectivity from evaluation that is always a factor where human judgment is involved. It also precludes too much emphasis on fragmented aspects of employee performance and encourages evaluation in terms of contribution.[14]

It is easy to get carried away with ideas for performance

criteria when there is such a sparsity of sound information available to consider, as in the professional R&D area. In the pure and applied science areas especially, there appears to be the potential for restrictive performance criteria to create as many administrative problems (and maybe more severe ones) than they may solve. The factors of control, discipline and standardization are recognized major sources of tension and conflict between the specialist (scientist) and the generalist (administrator).[15] If the objective is to create conditions which are conducive to effective performance, the supervisor (and his organization for that matter) will have to move carefully in this area.

Considering the results of some of the studies discussed earlier in this thesis, it is easy to see the possible adverse effects of externally imposed performance standards on the scientist and the motives characterizing high performance (such as self-reliance and frequency of communication).[16] The demotivational effects on performance of critical review in terms of standards in which the employee has had no say is a major argument made against unilateral management control.[17] Attempts to prescribe by standard the way aspects of the job should be accomplished may not only be dysfunctional in an operational sense, they impinge unnecessarily on a critical area of the job which the supervisor can use to develop employee satisfaction, psychological growth and, according to the responses of employees themselves, work motivation.[18] Quantitative performance measures - whether

single, multiple or composite - can have undesirable consequences for organizational and individual performance. Single and multiple criteria for example may cause faulty role perception in terms of what is really important in the job. Composite measures which give explicit weighting to the criteria may result in dysfunctional as well as functional psychological reactions. Ridgway concludes in his review of performance measures that, "the motivational and behavioral consequences of performance measures are inadequately understood" and "further research in this area is necessary for a better understanding of how behavior may be oriented toward optimum accomplishment of the organization's goals."[19]

Although the results approach helps give direction to performance evaluation, it too can be problematic if no attention is given the method by which the results are achieved. Unless the R&D professional works in a vacuum, which is not very likely, he also gives support to and receives support from fellow employees in the process of accomplishing a project. The employee who gets results by liquidating the other human resources and good will of the organization has made a questionable contribution. Likert is concerned about the adverse effects on the organization of the manager who gets ahead at the expense of others and then gets promoted out of the organization before the downturn in production takes place that he helped bring about. The manager who is not "supportive" in his relationships does not have a place in Likert's system of the effective

organization.[20] This concept appears to be applicable for non-supervisors as well as supervisors in an organization that requires effective coordination and interaction to accomplish its goals.

The state-of-the-art in performance measures appears to be such that one can get a better idea of what not to do in this area than what to do. This situation helps support the argument that a focus on assignment results and objectives is one of the soundest approaches to the R&D personnel performance at this time. Involving the employee who is to perform the assignment in the planning of it, and in the establishment of some measure of performance to judge work progress, is not only a way of increasing employee "ego" involvement and self-control. It may also improve the accuracy of the employee's perception of what is important in the assignment. Another major advantage accrues through employee participation, especially in R&D type of work. The scientist or engineer himself may very well be the most knowledgeable about what kind of progress or results it is reasonable to expect. Thus participation in the assignment planning stage gives greater assurance that a satisfactory rate of performance will be sustained and a degree of success assured.

It would seem to be evident from the lack of literature on the subject of performance criteria for professional positions that those people who should be expected to be concerned in this area have not placed much emphasis on it. The speculation made here is that this is largely because the people

who know the most about what true R&D contribution consists of recognize that the standard that makes the difference is the one "inside" the researcher or engineer. If this is in fact the case, then the argument for increased participation in assignment planning is further strengthened. Personal aspiration levels are set at a realistic level through a process of participative goal-setting in a nonthreatening context and this works in the interest of individual motivation which in the long run should benefit the organization as well.[21]

Assignment Review and Discussion

Appraisal Objectives

Employee development as the objective

The value of employee participation and of emphasis on job content factors in the performance evaluation process has been pursued throughout this paper. Emphasis has intentionally been placed on the importance of assignment planning to an integrated process of employee evaluation. Review has been cast as a forward looking, continuous process which emphasizes problem-solving in the assignment context. This attack is quite different from the traditional approach to performance evaluation. The traditional approach has more concern with the appraisal interview itself as the means of conveying the supervisor's judgments concerning the employee's progress in his work, which is intended to motivate improved performance.

The multiple ends sought in the traditional performance rating session have been found to be in conflict with each other. For example, a performance review discussion which

emphasizes promotion status and prospects may motivate a continuing high level of performance on the part of the employee who receives a favorable review. Research studies indicate, however, that defensive reactions which are activated by an unfavorable performance review interfere with the intended motivational effects of the discussion. This has caused some authorities on the subject to recommend a splitting of the appraisal discussion for promotion purposes away from the review intended to maintain or increase performance on the job.[22] Other experimental work points to the origins of some of the unanticipated results in the performance discussion and makes some suggestions which may be helpful to the supervisor seeking to increase employee motivation through the review process.[23]

Maier delineates three types of performance appraisal interviews each having different objectives (see Table 2). The interview approach which he describes as the "Problem-Solving" type appears to be useful to the supervisor in the review phase of the performance evaluation as proposed in this thesis. The compatibility of the "Problem-Solving" approach objective with the approach to performance improvement proposed herein is clear, i.e., to stimulate the growth and development of the employee through a focus on work. The studies reviewed in Chapter II and III stress the importance of the need for continued growth and development on the job if the employee is to continue to be motivated toward desired personal as well as larger organizational goals. The

TABLE 2.--Cause and Effect Relations in Three Types of Appraisal Interviews[a]

Method	TELL AND SELL	TELL AND LISTEN	PROBLEM SOLVING
Role of Interviewer	JUDGE	JUDGE	HELPER
Objective	To communicate evaluation To persuade employee to improve	To communicate evaluation To release defensive feelings	To stimulate growth and development in employee
Assumptions	Employee desires to correct weaknesses if he knows them Any person can improve if he so chooses A superior is qualified to evaluate a subordinate	People will change if defensive feelings are removed	Growth can occur without correcting faults Discussing job problems leads to improved performance
Reactions	Defensive behavior suppressed Attempts to cover hostility	Defensive behavior expressed Employee feels accepted	Problem solving behavior
Skills	Salesmanship Patience	Listening and reflecting feelings Summarizing	Listening and reflecting feelings Reflecting ideas Using exploratory questions Summarizing
Attitude	People profit from criticism and appreciate help	One can respect the feelings of others if one understands them	Discussion develops new ideas and mutual interests
Motivation	Use of positive or negative incentives or both (Extrinsic in that motivation is added to the job itself)	Resistance to change reduced Positive incentive (Extrinsic and some intrinsic motivation)	Increased freedom Increased responsibility (Intrinsic motivation in that interest is inherent in the task)

[a]From Norman R. F. Maier, "Three Types of Appraisal Interview" in Thomas L. Whisler and Shirley F. Harper (eds), Performance Appraisal (New York: Holt, Rinehart and Winston, 1962), pp. 402-403.

TABLE 2 (continued)

Method	TELL AND SELL	TELL AND LISTEN	PROBLEM SOLVING
Role of Interviewer	JUDGE	JUDGE	HELPER
Gains	Success most probable when employee respects interviewer	Develops favorable attitude to superior which increases probability of success	Almost assured of improvement in some respect
Risks	Loss of loyalty Inhibition of independent judgment Face-saving problems created	Need for change may not be developed	Employee may lack ideas Change may be other than what superior had in mind
Values	Perpetuates existing practices and values	Permits interviewer to change his views in the light of employee's responses Some upward communication	Both learn since experience and views are pooled Change is facilitated

"Problem-Solving" approach assumes that discussing job problems leads to improved performance. Instead of functioning as a judge, the supervisor using this approach is cast in the role of a helper. In addition to the skills of listening and reflecting feelings and ideas, the supervisor uses exploratory questions and summarizes the discussion. Skillful questioning can be used to stimulate the subordinate to evaluate his ideas and plans and to draw attention to areas that the employee may have overlooked. Summaries and pauses are recommended by Maier to allow the employee to explore and evaluate without feeling the pressure of time. This kind of discussion can develop new ideas and mutual interests. Another element that makes the "Problem-Solving" approach distinctive is its reliance on the motivation inherent in the task. Although change is facilitated by this type discussion, there is some risk inherent in the nondirective approach in that the change may sometimes be in a direction other than what the supervisor had in mind. The gain of improvement is not without some cost so the supervisor must weigh the benefit against the possible cost. Maier suggests that some employees may not respond to this approach, and this may necessitate use of one of the other types of interview technique.[24]

Other advantages of the "Problem-Solving" interview approach which are desirable include stimulation of upward communications and:

> In addition, it creates a climate for high quality decisions and changes since it pools the thinking of two people who have supplementary experiences.

> Resistance to change is a common obstacle to progress but this approach removes sources of resistance and stimulates change.[25]

This type of review is most effective when it is employed periodically as major aspects of assignments or full projects are completed. At that time, problems encountered on the last assignment and solutions developed may be a useful beginning point for mutual assignment definition and goal planning with respect to subsequent project phases or new assignments.

There are no pat answers for the supervisor here any more than there are in the work planning and assignment phases. The supervisor will have to assess his own personnel, work situation, and organizational environment and make his own judgment as to which approach to use (be it one of the three identified by Maier, some combination of these, or something altogether different). His own personality and those of his employees are of course also factors of some weight in this determination. For the supervisor's style to be believable, it must be consistent. Inconsistency between what he says and what he conveys through gesture, intonation, expression, and even omission gives concern to his subordinates and can cause them to wonder where they really stand with him.[26]

A final word on performance evaluation aimed at employee development. This thesis concentrates on employee development through the job. It does not attempt to delve into employee development in a formal or classroom situation. However, the approach to performance evaluation taken herein can readily lead into employee development beyond the job environment.

The problem-solving atmosphere of the performance review can bring the supervisor as well as the employee to see the need for strengthening capability through additional training which it may not be feasible to give on the job.

Performance rating as the objective

Since performance rating is a requirement in the Government Service, it must be accomplished. There is some flexibility in how it can be done, however, within which one can meet the requirement without causing it to become a demotivational experience.

A supervisor who has taken steps to make performance evaluation a meaningful part of his daily activities need not resort to discussion of character traits or generalities in the year-end rating discussion. He should be in the solid position of reviewing the year's activities on the basis of the mutually established work goals and accomplishments in terms of these, if he chooses to. If he wants to keep the summary rating process to a very minimum, it would be consistent with the approach he has followed all year to simply inform the employee of his rating and explain that it is based on his progress in reaching goals established during the year (which should be known to both supervisor and employee). The session can also be used to afford the employee an opportunity to raise questions about personal or work matters which he may have been reluctant to raise at other times. One management consultant put it very well when he said that "successful communication of appraisal results depends more on mutual

respect and trust than on technique."[27] It would probably be better not to have to go through this pro forma ritual at all, but until the requirement that the summary rating be discussed is changed, a low key approach should pose no major problems to the supervisor who does not mix in other conflicting objectives and is prepared to be objective, sincere, fair, and influenceable by the employee.[28] In this way, whatever threat an employee may have a tendency to feel can be reduced. "Employees will weigh our words in light of what they know about us," so long as the reviewer is himself.[29] Listening is also a key factor in the performance discussion as shown in Table 2 above.

In passing, it may be of use to the supervisor who is required to engage in a more detailed summary discussion of performance to be aware of some of the "stumbling blocks" to motivation under the objective appraisal approach to rating. The "problem of net effect"--averaging of an employee's good and bad performance in a given skill area can cause problems. For example, in the communications area, a supervisor may be a good listener resulting in high morale in his group, but poor oral and written communications may cause him to receive only a fair rating in communications which he considers unjust since morale is stressed as an important factor by the organization. "The problem of futility"--is brought about by rating systems which require "fruitless flagging" of all deficiencies. "Equal billing of trivia"--occurs when an unsatisfactory rating is given to a relatively unimportant

skill, causing it to stand out just as boldly as a high rating applied to an important area. "Loss in translation"--identifies the difficulty an employee faces in interpreting ratings in terms of future opportunities with respect to jobs other than the particular one on which he was rated. Frohlich concludes in light of these that objective measurement should be an unpublicized tool of management used in the administration of salaries and the promotion policy. His recommendation has considerable merit when applied to an organization which seeks to emphasize employee improvement in the appraisal process, and it also has application in the area of career promotions in the Federal Service.[30]

The information on employee progress which the supervisor accrues in the course of a year should serve him well when the time comes for his promotion recommendations to be submitted to whatever formal review process is established for this purpose in the activity. Notes made on significant progress during the year will be useful at this time. Also, the same holds true for the poor performer. That is, the close attention given performance will reinforce whatever management action is deemed necessary in this case.

Summary of Comments

This chapter seeks to operationalize some of the concepts discussed in Chapters II and III considering the Government R&D environment. The concepts are brought into the context of the work management process in a way that it is anticipated will be most meaningful to the supervisor. First, some

suggestions are offered that apply in the work planning and assignment end of the work management cycle. Major emphasis is given the need for a far-sighted performance evaluation process to begin with assignment formulation as opposed to the emphasis placed on the appraisal interview by more conventional approaches. It is suggested that the employee be involved by the supervisor in initial assignment planning and on a daily basis in those decisions which affect him and his work. A greater effort at understanding each employee is called for and is considered essential to a supervisor's efforts to build development opportunity into the employee's assignments. The clear advantage of frequent performance discussions to employee learning is pointed out. Results-oriented performance requirements are suggested in lieu of piecemeal attempts to measure performance in more "objective" smaller segments. Due to the ever changing nature and specialization of scientists and engineers' work in R&D, it is suggested that the employee himself is very likely a key source of information to a reasonable attempt to establish progress expectations for an assignment. The known effects of participation on performance are reiterated and effort is made to show where the concept comes into the assignment and review process. Finally, the performance review phase of the integrated evaluation approach is considered. A problem-solving orientation in the review is recommended for the supervisor who seeks employee development on the job as his objective. The administrative need for performance information is recognized, but it is suggested

that this can be accommodated by the integrated approach. The continuous evaluation process is shown to provide the supervisor with the information he needs to make promotion, training or other recommendations for his employees.

The next chapter states the conclusions and recommendations of the thesis.

FOOTNOTES

[1]For a detailed statement of both sides of this argument see" Douglas McGregor, "An Uneasy Look at Performance Appraisal," Harvard Business Review, XXXV (May, 1957), 89-94 for a critical view; and Harold Mayfield, "In Defense of Performance Appraisal," Harvard Business Review, XXXVIII (March, 1960), 81-87, for a favorable view.

[2]Thomas L. Whisler and Shirley F. Harper, Performance Appraisal (New York: Holt, Rinehart and Winston, Inc., 1962), pp. 426-427.

[3]This section and the following one are concerned with application of concepts discussed in Chapters II and III. See those chapters for additional details concerning the implications of the concepts for the proposition of the thesis.

[4]A description could conceivably vary from being so general that the recruit would not know where to start, to being so specific that there would appear to be little leeway for initiative.

[5]Whisler, Performance Appraisal, p. 81.

[6]Douglas McGregor, The Human Side of Enterprise (New York: McGraw-Hill Book Company, 1960), 76.

[7]Saul W. Gellerman, Management by Motivation (New York: American Management Association, 1968), p. 154.

[8]Donald C. Pelz and Frank M. Andrews, Scientists in Organizations (New York: John Wiley and Sons, 1966),p. 77.

[9]Victor H. Vroom, Work and Motivation (New York: John Wiley and Sons, Inc., 1964), p. 240.

[10]Herbert H. Meyer, Emanuel Kay, and John R. P. French, Jr., "Split Roles in Performance Appraisal," Harvard Business Review, XLIII (January, 1965), 127.

[11]Ibid., p. 124.

[12]Pelz, Scientists in Organizations, p. 53 and p. 237.

[13]George S. Odiorne, Management by Objectives (New York: Pitman Publishing Corporation, 1965), p. 100.

[14]The Civil Service performance evaluation approach has characteristically stressed comparison of performance against the requirement of each of the primary position duties reflecting the continuing influence of "Scientific Management."

[15]John M. Pfiffner and Robert Presthus, Public Administration (5th ed.; New York: Ronald Press, 1967), pp. 134-137.

[16]Pelz, Scientists in Organizations, p. xi.

[17]Meyer, "Split Roles in Performance Appraisal," pp. 124-129.

[18]Frederick Herzberg, Bernard Mauser, and Barbara Synderman, The Motivation to Work (2nd ed.; New York: John Wiley and Sons, Inc., 1967), pp. 132 and 177.

[19]V. F. Ridgway, "Dysfunctional Consequences of Performance Measurements," Administrative Science Quarterly, I (September, 1956), 240-247.

[20]Rensis Likert, The Human Organization (New York: McGraw-Hill, Inc., 1967), pp. 146-55.

[21]Alvin F. Zander, ed., Performance Appraisals - Effects on Employees and their Performance, Report of a seminar, Ann Arbor, Michigan, March 1963 (Ann Arbor, Mich.: Foundation for Research on Human Behavior, 1963), pp. 5-17.

[22]Meyer, "Split Roles in Performance Appraisal," pp. 123-129; Norman R. F. Maier, "Three Types of Appraisal Interview" in Whisler, Performance Appraisal, pp. 392-404.

[23]Zander, Performance Appraisals, pp. 5-17.

[24]Maier, "Three Types of Appraisal Interview," pp. 392-404.

[25]Ibid., p. 402.

[26]Gellerman, Management by Motivation, p. 47.

[27]Robert K. Stolz, "Appraisal Interviews: A Common Sense Approach" (New York: McKinsey and Company, Inc., 1961), p. 11.

[28]Zander, Performance Appraisals, pp. 16-17.

[29]Mayfield, "In Defense of Performance Appraisal," p. 86.

[30]W. O. Frohlich, "Motivation: Key to Successful Performance Counseling," Personnel Journal, XLV (February, 1966), 92-93.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

Summary and Findings

The proposition of this thesis is conditionally supported. That is, personnel performance evaluation structured as an integrated part of a management process of work assignment and review which involves participation by the employee can be a useful vehicle for employee motivation through the job in government research and development activities. Conceptual support for the conclusion was found in research-based studies of participation in decision-making, job factors and employee motivation, and the job climate. Conditions which appear to be essential to the workability of the integrated approach to employee evaluation are discussed below.

In the introductory chapter to the thesis, it is indicated that the purpose of this study is to seek performance evaluation ideas which will be of assistance to supervisors in carrying out their day-to-day personnel management responsibilities. Specifically, the effort of the thesis was to explore the usefulness of performance evaluation as an integrated process to the technical supervisor faced with problems of motivation among subordinate scientists and engineers.

The circumstances which generated the interest of the

writer in pursuing the proposition of the thesis were described as they developed at the Kennedy Space Center, NASA. After the period of tremendous growth and expansion which the Center underwent in meeting its responsibilities for Project Apollo, program activities were decelerated and budgets reduced. Supervisory and organizational perturbations, which were overlooked by employees during the years of great challenge and high motivation created by the national goal of the moon landing, became issues of concern to employees as Apollo approached reality. Supervisors who had been selected for their positions primarily on the basis of technical competence during the Apollo build-up were not prepared to deal with the problems of employee motivation that confronted them.

One source of the problems which arise in the kind of situation described above is insufficient communications concerning work requirements and performance expectations.

Employee performance evaluation was one of the areas of supervision identified as needing attention by the Civil Service Commission and NASA during their periodic personnel program reviews of Agency field centers. The writer's own experience as a personnel specialist in two of the NASA field centers confirmed this as a fertile area for personnel management program improvement.

Personnel performance evaluation was thus selected as one area of R&D supervision in which improvement could possibly help with work communications and also might help fill an anticipated motivation void created by the passing of a major

urgent agency goal, the moon landing. The study was initiated on the basis of the writer's specific concern with the situation at the J. F. Kennedy Space Center, NASA. However, in seeking to analyze the prospects of the usefulness of the proposition of the thesis the formal performance evaluation plans of two other NASA centers were also included to give some additional breadth to the study. Although performance evaluation is only one facet of a supervisor's job, it appeared to have real potential for use in coping with the kind of problems facing him in the readjustment situation referred to at the KSC.

The method of the thesis was to analyze and evaluate current, research-based management and motivation concepts derived from studies which focused primarily on technical personnel as subjects or at least included them as subjects. This effort was aimed at determining if the proposition of the thesis was supportable from a conceptual standpoint. Information on center performance evaluation practices was obtained by examination of their published plans and through discussion with officials from each of the particular centers studied. Background data on performance evaluation within NASA was obtained through specialists in the Agency personnel directorate. U. S. Civil Service issuances were another source of official information. The writer's first-hand experience with two of the subject centers was useful in assimilating and evaluating the information obtained from the NASA sources.

Chapter II of the thesis examined the effects of management

philosophy and behavior on employee performance. It also reviewed the concept of participation, and its implications for the proposition of the thesis. It was concluded on the strength of McGregor's argument and the work of Likert, and others at the University of Michigan, that without some degree of trust and confidence by management in its employees, the proposal to integrate performance evaluation in the management process would not be effective. This is because some degree of participation in job planning and review is considered an essential ingredient of the integrated performance evaluation approach and without a favorable attitude on management's part, it cannot take place. With an attitude on the supervisor's part which is conducive to employee involvement with him in the assignment and review process, it appears that a major step has been taken in the direction to increased employee motivation. Participation in the decision-making process presents the employee an opportunity to realize the higher level esteem and self-actualization needs according to McGregor. It enhances his ability to do his job through a process of internal control described by McGregor as "Integration and Self-Control." Research shows that greater commitment to the job comes with participation and the internalization of objectives that tends to accompany it.

The work of Vroom, Likert, and Meyer, Kay and French provide support for the idea that employee participation in the decision-making process with respect to work he is to carry out can have a favorable effect on performance. McGregor

emphasizes that participation can most usefully be considered in terms of a range of managerial actions. The exercise of authority in decision-making is almost complete at one end of the range and participation is negligible. At the other end the reverse is true. Herzberg adds the idea that a reasonable degree of participation in the decision process of large and complex organizations may be the determination of "how" goals are reached. Participation may not have the desired effect on the authoritarian-conditioned personality or the employee whose primary interests reside outside of the job situation. Nevertheless, Likert finds that organizations can move in a participative direction over a period of a year or more with management leadership supporting the change.

This chapter shows that the integrated process of performance evaluation is consistent with the behavioral research findings concerning employee motivation. It also sheds light on why the traditional approach, which proposes to increase employee effectiveness by telling him where he stands with respect to job requirements determined solely by his supervisors, is not consistent with what is known concerning employee motivation.

The thesis finds that employee participation in work planning and goal setting can have favorable effects on performance. The other and more central supporting elemen of the thesis is that the job and job content factors can be used through the integrated performance evaluation approach to enhance the motivation and effectiveness of R&D professionals.

The integrated process of performance evaluation encompasses both participation in assignment decision-making and use of the job to maintain and build employee motivation.

Chapter III analyzes the idea of motivation through the job by reviewing the works of several authorities in the field. Motivated behavior as used herein is defined as voluntary behavior. The strength of the force on an employee to choose a given course of action is considered to be directly related to the product of the valence of the desirability of an outcome and the expectancy that the course of action will be followed by the outcome. Of course, ability is the foundation stone on which motivated behavior must rest for it to be effective.

Herzberg's work and the follow-on studies of Myers and others make a clear distinction between the potential positive motivational effect on job attitudes of work itself, responsibility, advancement, achievement and recognition, or the job content factors, and the potential negative effect of job context factors. The latter include as major factors found associated with negative job attitudes: company policy and administration, supervision, salary, interpersonal relations, and working conditions. According to these findings, it is necessary to maintain the job context factors or "dissatisfiers" at a satisfactory level or employees become dissatisfied with their work situation, but the tendency for attitudes to affect performance favorably was greater for the job content factors or "satisfiers."

Performance evaluation as proposed in the thesis focuses

on the work itself, and is primarily concerned with employee effectiveness and development on the job. Although attention must also be given the "dissatisfiers," the main thrust of the supervisor's efforts in the performance approach as conceived is to help the employee grow on his job through participation and the motivating force of the positive job factors.

Since the job content factors, which Herzberg's and Myers' subjects indicated had the greatest effect on their attitudes toward their work and performance, can be directly affected by the supervisor through the vehicle of performance evaluation, it is concluded that this provides further support for the idea that employee motivation can be enhanced through the integrated approach proposed.

This approach calls for the supervisor to plan and organize the employee's work assignments with a degree of employee participation which is feasible and reasonable under the conditions of personality and the environmental circumstances present in the particular situation. The individual needs some measure of control over his job to realize a sense of achievement and growth.

Herzberg's "motivation-hygiene" approach to job motivation contains several major implications for the management of people. The supervisor will need to give less attention to the wages and other peripheral conditions of work, the "dissatisfiers," and more attention to designing jobs to create positive motivation in the doer, the "satisfiers." One basis for Herzberg's "motivation-hygiene" concept is found in the

psychological concept of "conditioned learning" which uses an individual's own high preference behaviors as a source of motivation.[1] "Motivators" identified by Herzberg's subjects can be built into work assignments by the perceptive supervisor, making possible the exercise of high preference behaviors on the part of the employee and building motivation.

Pelz's and Andrews' work shows a number of job factors which are found to be associated with effective scientists and engineers. The integrated performance evaluation approach is a ready channel through which the supervisor can structure into work assignments some of Pelz's and Andrews' "creative tensions" (Table 1) which are judged appropriate to enhancing employee effectiveness in a particular situation. Both Herzberg and Pelz found strong motivation possibilities in job design and the work assignment situation. While the effective scientist is characterized as self-reliant or "inner motivated," Pelz and Andrews found that this did not mean isolation from people. Although these scientists pursued their own ideas and valued freedom, they also interacted vigorously with their colleagues. Pelz found the "creative tension" between the security of independence and challenge of colleague interaction was characteristic of the more effective scientist. Self-reliance by itself was not enough. R&D professionals contributed most when they strongly influenced key decision-makers, but also when persons in other positions had a voice in selecting their work goals. The "creative tensions" identified between independence and

interaction and between the opportunity to influence decisions but also be influenced by others, are typical of Pelz's and Andrews' findings. Their study identifies job aspects that can be designed by the supervisor to enhance the performance of the effective R&D employee or at least to sustain a high level of performance. It seems clear that a skillful combining of the factors of specialization and diversity in the assignments of the younger and older professional show prospects of motivating the younger scientist and extending the useful career of the older researcher.

In summary, the supervisor can employ performance evaluation to help build a work environment conducive to effective performance. Through a process of mutual work-goal planning and engaging the employee in the assignment determination and review phases of the work cycle, he can strengthen employee job commitment. Also through this same process he can take steps to build in "creative tensions" and "satisfier" factors to reinforce and sustain effective performance.

The possible favorable effects on performance of effort by the supervisor to clarify role perceptions is also discussed in Chapter III. Factors of organization, the work group, and pay and reward systems are noted. The importance of organization to effective performance is recognized, but not dealt with in depth, since it is usually beyond the control of the individual supervisor whom the thesis seeks to counsel. Regarding the group, it is concluded from the literature that the supervisor can influence its members' performance in the

direction of organization goals by maintaining his own performance expectations at a high level and being supportive of them in the work situation. Pay and promotion effects on performance are seen to be determined largely by the value system of the individual. The usual promotion limitations acting on a supervisor lend further support to the proposition that the noneconomic job motivators need to be developed. An important point about promotions is that they must be visibly and directly associated with high performance and achievement on the job if they are to encourage effective performance. Intelligently applied, the integrated approach to performance evaluation can help clarify roles, favorably influence group performance norms, and provide the basis for effecting deserved promotions and emphasizing their significance.

Taken together, and used with a reasonable amount of mature judgment, there appears to be a good case that Herzberg's "motivators" and Pelz's "creative tensions" along with the findings of Meyer, Kay and French concerning the favorable effects of employee participation in the work planning and review process provide a defendable conceptual base for the thesis proposal.

In Chapter IV, the legal, policy, and regulatory setting of performance evaluation in the government in general and in NASA activities in specific is reviewed and evaluated. The Performance Rating Act of 1950 is found to be rather inflexible in several aspects, but it does not preclude an integrated approach to performance evaluation. This Act is credited,

however, as one source of the narrow "rating" view of performance evaluation prevalent in the Federal Service. The Civil Service Commission describes performance evaluation as a continuing, day-to-day responsibility of the supervisor and suggests the use of employee participation in establishing work standards, but it has done little in the area of motivation through the job. Change in the Performance Rating Act appears to hinge on a favorable political climate and better behavioral research backing than has been available.

NASA, after some trials and tribulations, has settled on an Agency policy which permits a maximum of flexibility for its field centers to establish performance plans within existing law and regulation. A review of the three Manned Space Flight Centers' official performance evaluation plans indicates that they are essentially similar documents which meet the requirements of law and regulation, but go little beyond them in a substantive direction like that discussed in this thesis. Discussions with center officials and the experience of the writer indicate that these plans are implemented in a largely perfunctory manner to meet the requirements of the Act. One exception is the use by the Manned Spacecraft Center of an appraisal form which provides the supervisor with a list of general qualities to guide him in the annual appraisal process. Use of the form is limited to the performance discussion and is intended to improve communications between the supervisor and employee regarding performance requirements and progress. There is generally

little enthusiasm for the annual performance rating requirement among the centers studied, which is not unexpected in highly technical organizations such as these. To the writer's knowledge, the performance evaluation training given supervisors in the past in these activities has been of a procedural, rating orientation as opposed to an effectiveness orientation.

There is a bright spot, however; "lateral coordination" has been accomplished within and between these centers through semi-formal boards, panels, and working groups. According to Likert, this gives indication of management attitudes and organizational flexibility conducive to a high degree of participation. If this is the case, the prospects are good of the integrated approach to performance evaluation contributing to employee motivation in these centers.

In Chapter V, some performance evaluation suggestions are offered that apply in the work planning and assignment and the review phases of the work management cycle. There is an effort made to synthesize the concepts evaluated in Chapters II and III with some practical considerations. Emphasis is given to a forward-looking, continuous process of evaluation which brings the employee into work decisions affecting him. Ways of achieving motivation through the job factors are considered. The potential contribution that the R&D professional can make to results-oriented performance requirements through his specialized knowledge is discussed. It is concluded that a problem-solving approach to the periodic performance review appears to be most consistent with employee

learning, improvement and development on the job. The need for administrative appraisal information is recognized, but it is concluded that this need can readily be met by the supervisor who has used the integrated approach to performance evaluation.

Conclusions

The findings of the analysis and evaluation made of the management and behavioral concepts in Chapters II and III, and summarized in the above section, are considered to conditionally support the proposition of the thesis. To repeat that proposition: personnel performance evaluation structured as an integrated part of the management process of work assignment and review which involves participation by the employee can be a useful vehicle for employee motivation through the job in government research and development activities.

The terms "conditionally support" are used to emphasize the many considerations discussed in the thesis that bear on the workability of the proposal. They are also used to enter the qualification that no primary research or experimentation has been done in the R&D area, to the writer's knowledge, which combines the continuous, participative-kind of performance evaluation approach with a serious effort to design or build motivation into the job itself. The work which comes the closest to offering direct experimental support for the first portion of the proposal, i.e., the integrated, participative-kind of performance evaluation approach, is that of Meyer, Kay, and French conducted at General Electric.[2] As noted

earlier, the work of Herzberg, Myers, and Pelz and Andrews provides the major support for the second part of the thesis proposition, i.e., achieving motivation through job assignment design action using job content and environment factors. Criticism can be made of these studies on the grounds of the correlational nature of their analysis, but the question can then be put, "Who has done a better job in this area?" It is felt that the results of these studies can be realistically applied so long as the user does not lose sight of the fact that they do not necessarily represent cause and effect relationships.

Other conditions and limitations must also be weighed in acceptance of the thesis proposal and extension of the idea to other occupations and types of organizations. The government R&D professional, especially the development professional, is the specific subject of the thesis, and he is viewed against the organizational setting of a young and dynamic agency, NASA, which is currently going through a readjustment phase in its programs. What may be a reasonable proposal for sustaining and promoting effectiveness in a government activity of this nature may not be economically feasible to the smaller, private firm, which must exercise greater concern for profits and efficiency. Performance evaluation proposals which do not consider the economic side of the picture, i.e., if that is a primary purpose of the organization, are of little use. Also the integrated approach is not an answer to employee motivation problems by

itself, as indicated above, nor can it be effectively implemented by short term measures. For example, Texas Instruments established a five year program of training for its supervisors to implement its own version of the "motivation-hygiene" concept of employee motivation.[3]

Supervisors who are naturally effective in employee relations skills and are good in work planning and organization should be able to constructively use the proposed approach to performance evaluation much sooner than those who are less prepared. The latter will need a great deal of formal training as well as informal assistance to develop the understanding and skill needed to make performance evaluation a positive job-centered experience for their employees. Some will very likely have great difficulty adjusting to this approach due to their personalities and previous experiences.

However, be it government or industry, the R&D professional is a resource of special concern and measures to keep him productive, although expensive, need to be tried. What is the anticipated payoff of an effort to create and maintain a job and job climate which is conducive to effectiveness? It is hard to tell, but it is a tantalizing question which opens the door of interest to the whole subject of motivation and work.

Recommendations

Further Research

The aspect of this study which most aroused the interest of the writer was the seemingly tremendous motivation potential

of the job assignment itself and job content elements and at the same time the small amount of well-conceived research that has been done on job motivation. There appears to be a reluctance to grappel with the problem for some reason or reasons, especially in the more creative occupations. This is possibly due in part to a recognition of the complexity of the matter and the difficulty of constructing research which gives promise of useable results and at the same time is economically and operationally feasible to carry out on an experimental basis.

Several recommendations can be made concerning additional research in the critical area of man and his job. It occurs to the writer that the validity of Herzberg's method could be tested further by incorporation of some measure of performance. Support for a meaningful relationship between the expressed feelings of his respondents that certain job content factors brought improvement in their performance and some evidence of this result could possibly be established in the following manner.[4] An organization which has a practice of maintaining good performance records (e.g., date and nature of major contributions, reports, etc.) could be surveyed by the Herzberg interview technique. Then an analysis could be made comparing employees' "high" and "low" feelings about the job with performance records to see if the feelings concerning the job are reflected in performance records.

Clearly more research of the quality and nature of that of Pelz and Andrews is needed in the R&D area.[5] Also, the

Meyer, Kay, and French kind of experiment could be repeated by other organizations interested in comparing the effects of the participative approach to performance improvement with the more traditional approach.

A very important area that needs more serious study, and possibly less speculation, is the area of translation of behavioral research findings into operational application. This becomes more critical as the products of improved behavioral research methods begin to accumulate and social pressures in this area rise.

Far more effort needs to be expended on the study of employee motivation and the job. Few things are more important to management and the employee than knowing more about the effects of work on man's behavior and vice versa.

Performance Evaluation Programs

As a result of this study, several recommendations can be made with respect to the KSC performance evaluation program, and programs of similar organizations, which show promise of assisting the supervisor in the area of work communications and employee motivation.

To begin with, for the integrated process of performance evaluation to be workable there are certain conditions beyond the immediate supervisor's control which appear to be necessary. The overall management philosophy and behavior, its policies, practices, and the resulting organization structure will need to be conducive to a reasonable degree of employee participation in decision-making where his job is involved.

The flexibility and performance of the KSC as a team under the stress and tremendous responsibility of the Apollo Program appear to indicate no major obstacles in this area.

allenging work is another prerequisite to the process of motivation through the job. The whole substance of the thesis proposal rests on the availability of work which will provide sufficient challenge to the R&D professional to hold his interest and present the opportunity for exercising his abilities to learn and do. The job itself must serve as a source of motivation and a channel through which the supervisor and employee can maintain and build the conditions that Pelz, Myers, Herzberg, and others have defined. Indications are that there is less purely technical work available now than earlier in the KSC program, but there is challenging technical management and coordination work to be done.

Another assumption implicit in the idea of employee motivation posed here is an individual need structure in which the economic needs are largely met and noneconomic needs for esteem and self-actualization are prepotent.[6] Of course this will vary between individuals (especially from the young recruit to the older career professional), but in general, with recent government pay improvements, this is not a major problem.

A fair degree of skill in human relations and psychology and a good knowledge of work planning and organization, as well as ability to exercise this knowledge, are needed by the supervisor to effectively utilize the integrated approach to

performance evaluation and improvement. The full circuit has been made. This thesis was initiated with the plight of the poorly prepared supervisor foremost in mind.

The integrated approach can help the supervisor deal with problems of work communications and employee motivation, but he will need preparation and assistance to use it effectively. In addition to greater understanding of his employees, he will need to learn how to plan and organize work and to make constructive use of its motivation potential as this relates to effective performance of the individual scientist and engineer. He will need to be able to recognize good work and reward it appropriately.

Program action that is called for includes the best training the organization can develop or contract for, to include courses in individual capabilities, perception, motivation and the job, and interpersonal communications.[7] Courses in work planning and organization and job analysis are essentia

As this thesis has pointed out, an overemphasis on human relations training to the neglect of job content factors is not consistent with recent behavioral research findings concerning motivation and the job. This is not to say that human relations training is not an essential ingredient of a well-balanced supervisory training program. It is and should be included. The most effective supervisors will maintain optimal personal relationships which pave the way to better communications with the employee and establish

a climate conducive to supervisor-employee cooperation in the work effort.

For the supervisor who is not a "natural" when it comes to personal relations and the other supervisory skills, learning and implementing the integrated approach will take some time, as noted above. In order for the organization and its employees to begin to gain some of the benefits of this approach as early as possible, and as a supplementary aid to a more formal effort, a planned, personnel specialist assistance program is suggested.

Of course the specialists themselves are not necessarily authorities or expert practitioners regarding the skills of concern. Thus, before an assistance program is implemented, the personnel specialists who are to aid supervisors should receive training or refresher courses in the same subjects recommended for the supervisors. If these conditions are met, the skilled, alert personnel specialist can be of great assistance to the supervisor interested in adopting the integrated approach.

Working closely with the supervisor, the personnel specialist can help him translate the concepts received in the formal training situation into practical application. In this way, besides reinforcing acceptable performance and sustaining effective performance, some borderline cases in the performance area can be dealt with before they develop into serious problems. These cases, as well as those which have already reached major problem proportions before the

specialist is called in, can serve to provide "experiential" learning opportunity for the supervisor. This kind of learning can help the supervisor understanding his own reactions to the problem as well as gain better insight into possible causes in the employee or work environment.

The few comments made above are not intended to be a complete treatment of how to implement the ideas developed in the thesis. Further work will be needed to adapt the proposition to the program structure of the user.

As this paper was being written, one problem kept cropping up. The writer found it very difficult to maintain a distinction between performance evaluation as conceived by the thesis and performance motivation. This no longer poses much of a problem. Performance evaluation with the objective of maintaining or improving employee performance is largely a motivation-centered process if it fulfills its intended purposes.

FOOTNOTES

[1]Robert T. Golembiewski and Frank Gibson, Managerial Behavior and Organizational Demands: Management as a Linking of Levels of Interaction (Chicago: Rand McNally and Company, 1967), pp. 61-63.

[2]Herbert H. Meyer, Emanuel Kay and J. R. P. French, Jr., "Split Roles in Performance Appraisal," Harvard Business Review, XLIII (February, 1965), 123-129.

[3]M. Scott Myers, "Who are your Motivated Workers," in David R. Hampton (ed), Behavioral Concepts in Management (Belmont, Calif.: Dickenson Publishing Company, Inc., 1968), pp. 64-65.

[4]Frederick Herzberg, Bernard Mauser and Barbara Block Synderman, The Motivation to Work (2nd ed.; New York: John Wiley and Sons, Inc., 1967).

[5]Donald C. Pelz and Frank M. Andrews, Scientists in Organizations (New York: John Wiley and Sons, Inc., 1966).

[6]Abraham Maslow, "A Theory of Human Motivation" in David R. Hampton, Charles E. Summer, and Ross A. Webber (eds), Organizational Behavior and the Practice of Management (Glenview, Ill.: Scott, Foresman and Company, 1968), p. 39.

[7]Nicholas J. Oganovic and Harold H. Leich, "Human Resources for Science Administration: Can Quality be Enhanced?" in Issues in Public Science Policy and Administration: A Symposium (to be published in connection with the Program for Advanced Study in Public Science Policy and Administration, the University of New Mexico), pp. 42-43, for relevant courses.

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