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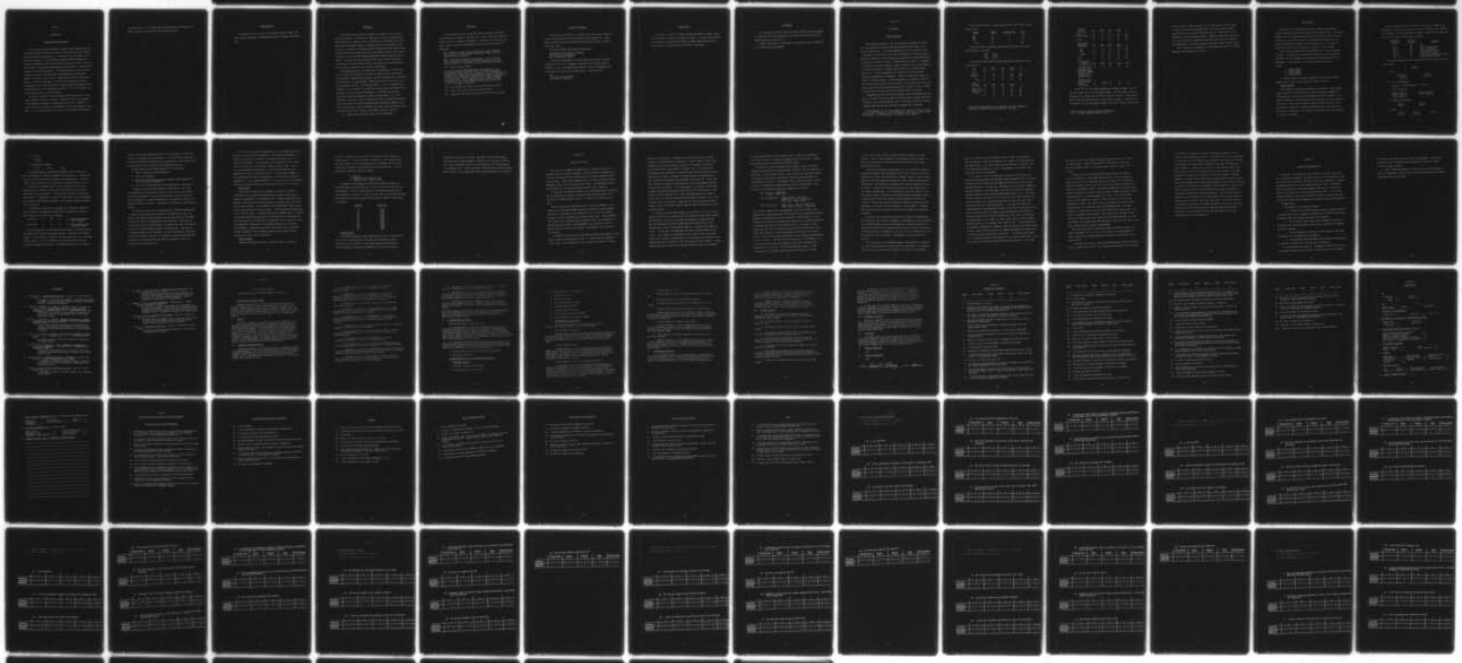

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DEFENSE SYSTEMS MANAGEMENT SCHOOL

PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

FORT BELVOIR, VIRGINIA 22060

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AN ASSESSMENT OF SOME PMO ENGINEERING PERSONNEL ATTITUDES

STUDY PROJECT REPORT
PMC 74-2

Allen C. Livingston
LTC USA

(1)

AN ASSESSMENT OF SOME PMO ENGINEERING PERSONNEL ATTITUDES

Study Project Report

Presented to the Faculty

of the

Defense Systems Management School

in Partial Fulfillment of the

Program Management Course

Class 74-2

by

Allen C. Livingston
LTC USA

November 1974

This study project report represents the views, conclusions, and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management School or the Department of Defense.

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DEFENSE SYSTEMS MANAGEMENT SCHOOL

STUDY TITLE: AN ASSESSMENT OF SOME PMO ENGINEERING PERSONNEL ATTITUDES

STUDY PROJECT GOALS:

To provide the PM with an assessment of engineering personnel attitudes in three areas: Characteristics of Working Environment, Relationships With Superiors and Basic Professional Aspects.

STUDY REPORT ABSTRACT

The purpose of this study project is to obtain an appreciation of a specific project office engineering personnel attitudes in three areas: Characteristics of Working Environment, Relationships With Superiors and Basic Professional Aspects. Three items of demographic data were used in concert with the attitudinal areas. These are age, time in the organization and time in specialty. All elements used in preparing this report were selected by the Project Manager for Munitions Production Base Modernization and Expansion, for whom this study was expressly prepared.

The report covers responses by 36 professional engineers to 26 questionnaire statements and discussions with a majority of the engineers. The study concluded that while there are some minor areas that could be improved upon, the AMCPM-PBM project office engineering staff holds their immediate superiors in very high esteem, has adequate time to perform their duties in an atmosphere they help design through the latitude they have in performing their tasks. Also, they find employment in the project office to be professionally rewarding. The only area that could be improved upon is the younger engineer-top management relationship wherein the younger engineer wants an opportunity for more exposure to the PM and the Deputy PM.

This report does not exhaustively research the engineer job satisfaction aspect, but does provide a basic ground-breaking from which to pursue a study of this type.

KEY WORDS

PERSONNEL MANAGEMENT SCIENTIFIC PERSONNEL CAREER MANAGEMENT MOTIVATION PROGRAM MANAGEMENT

NAME, RANK, SERVICE	CLASS	DATE
Allen C. Livingston, LTC, U S Army	PMC 74-2	November 1974

DEDICATION

To my wife, Anne, whose love for me, understanding of how the Army "operates", and unique ability to assume the role of father too, and who has endured another separation ... continues to prove that service wives are indeed a cut above the average.

EXECUTIVE SUMMARY

The purpose of this study is to provide the Project Manager for Munitions Production Base Modernization and Expansion (AMCPM-PBM) with an assessment of some attitudes of project engineer personnel towards their work. While this study may be closely associated with certain job satisfaction/job enrichment parameters, it is not intended to delve into that particular area specifically. The study is based on a survey conducted among 36 engineers assigned to AMCPM-PBM.

I will not list in this executive summary all 64 survey questions due to space limitations; however, they have been categorically grouped into seven major areas of interest:

Characteristics of Program Management
Characteristics of Working Environment
Teamwork
Basic Working Procedures
Relationships with Superiors
Basic Professional Aspects
MM&T (Manufacturing Methods and Technology)

Of these seven major areas, this study addresses three of them selected by the PM as of most interest to him at this time. These are:

Characteristics of Working Environment
Relationships with Superiors
Basic Professional Aspects

The results indicate that the overall working environment provides an atmosphere conducive to providing an unhurried yet sufficiently productive work-day with the engineers given considerable latitude in the conduct of their business. The engineer-superior relationship is an above average one, especially at the Division/Branch level. The relationship is not as good

above that level. Finally, the "average" engineer is quite satisfied professionally with his job in the PM office.

The major point of interest obtained from the study indicates that the project office engineering personnel have a positive, healthy attitude towards their work and that they are dedicated to fulfilling their assigned tasks.

ACKNOWLEDGEMENTS

I am indebted to the engineering personnel of the Office of the Project Manager for Munition Production Base Modernization and Expansion (AMCPM-PBM) for their outstanding assistance. Through open and frank discussions and survey responses, these two instruments of communication have provided the input for this study. I am indeed grateful to Doctor George G. Eddy who has influenced me. And finally, I wish to acknowledge the valuable assistance and guidance provided me by my advisor, Mr. William G. Gicking, Registrar, DSMS, Fort Belvoir, Virginia.

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SECTION I

INTRODUCTION

Purpose of the Study Report

The Office of the Project Manager for Munitions Base Modernization and Expansion, hereafter referred to as PBM, has been projectized for slightly more than one year (see Appendix A). The nucleus for this project office was the now defunct U. S. Army Munitions Commands (MUCOM) Manufacturing Technology Directorate (MTD) and the cadre for the project office were the MTD personnel. Along with the designation of Project Office, there came the approval for additional personnel. MTD had approximately eighty personnel authorized, of which there were about 25 employees who were engineers; general, industrial, chemical, etc. PBM was authorized twice the MTD population ... 160 total employees. This Table of Distribution (TD) that was approved for the PBM project office includes about 46 employees who have the responsibility for the engineering success of a $7 billion program, the single largest project in the Army today.

This study, undertaken with the express consent and direction of the Project Manager, BG Robert J. Malley, is intended to obtain an assessment of PBM engineering personnel attitudes toward their work in general in order to evaluate its effect on the operation of the project managers office (PMO). It is pointed out that this study is not concerned with measuring

job satisfaction. It is intended that insight gained from reviewing this paper, though, will be beneficial for future researchers.

Study Objective

The objective of this study is to provide the Project Manager (PM) with a general assessment of engineering personnel attitudes toward their work.

Background

As the PBM project office has increased its personnel rolls, the work has also increased. The project has grown both in scope and responsibility. What started out in February 1969 as a five-year plan estimated to cost $2.4 billion has subsequently grown to a twenty-two year plan estimated at over $7 billion. Obviously, new tasks have been assigned to PBM and some old ones have been updated to include revisions in the state-of-the-art, most commonly referred to in project terminology as Manufacturing Methods and Technology (MM&T). Naturally, the accomplishment of this work has been thrust upon the engineers hired by PBM to delve into such matters and to ensure timely and successful completion of the mission of the project.

The engineering staff, all professionals with degrees to "prove" their ability, have for the most part set about to accomplish their many chores. The magnitude of these chores is awesome, and the responsibilities associated with their work is no small matter. Monitoring the work involved in a $7 + billion project requires firm decision making ... quite a responsibility. Therefore, it's only natural for the PM to be curious about the general work attitude of this small group of employees. On more than one occasion, General Malley has asked questions concerning the engineers, e.g., their knowledge or awareness of the big picture, the time to accomplish their work, their relationship with other engineers within the project, whether or not they like their work, their relationship with other project divisions, their relationship with their superiors, does anybody listen to them, etc.

It is against this backdrop that this study is undertaken.

Definitions

In the preparation of this study, the usage of program and project is interchangable and intended to mean the same. Study, study paper, paper and report are used interchangably throughout. To provide clarification to the reader, there are several other abbreviations and terms that require an explanation:

PBM - Shortened version of the project office symbol AMCPM-PBM, which stands for Project Manager for Munitions Production Base Modernization and Expansion.

MM&T - Manufacturing Methods and Technology. This is the term used to distinguish a project submitted to develop or assist in the development of a new process or technique heretofore unknown.

PMO - Project Managers Office.

Munitions Production Base Modernization and Expansion - A $7 + Billion Army program started in 1970 and currently forecasted through 1992 to modernize and, as necessary, expand the munitions production base located at 25 Army ammunition plants, three arsenals and various privately-owned industrial firms located throughout the United States. Most of these facilities were built during or before World War II and designed to employ the state-of-the-art as it was known at that time.

LAP - Load, Assemble and Pack; one of the PMO division offices.

MPTS - Metal Parts; one of the PMO division offices.

P&E - Propellants and Explosives; one of the PMO division offices.

Scope of the Report

For the sake of simplicity, I am reporting on only three of the seven major attitude groupings resulting from the survey (Appendix D). These three have been identified by General Malley as having primary interest to him at this time.

This study assesses these three attitude areas:

Characteristics of Working Environment
Relationships with Superiors
Basic Professional Aspects

In making the assessment, I will correlate the individual engineer's attitude to that of his colleagues to determine the "average" engineer attitude. I will also address three pertinent pieces of demographic data to determine its effect on the survey answers. These three are:

Age
Time With the Organization
Time Worked in Specialty

Organization

The study is organized by major attitude assessments in order to maintain some logical approach in providing findings. To further assist, within each research area, applicable comments are made regarding actions that could be taken to improve certain conditions, if warranted.

Limitations

This study paper shall be limited to survey responses from 36 engineers in one PMO and information obtained by the author during discussions with these engineers and supervisors.

Further, this report is limited due to available time and is therefore not a complete research document.

SECTION II

METHODOLOGY

Data Collection

The research was based on a 64 item questionnaire (Appendix B) which was to be answered by selecting the most appropriate choice from 1 to 5 on any attitude scale. As Dunn and Stephens point out, an attitude scale is designed to elicit from an individual an expression of feeling toward an object of reference in order to obtain his expression of his feeling toward the object of reference (3:3621).[1] These choices were based on a frequency of occurrence situation, designed to offer a selection from a range extending from an occurrence of "almost never" (choice #1) to "almost always" (choice #5). Choice 3 represented the mid-point or neutral position, generally associated with "sometimes". Choice #2 represented "seldom" and choice #4 indicates "often". Before responding to any question, each participant was asked to make a choice from the 1 to 5 range based on the usual day-in, day-out situation that was typical over a period of time. Dramatic, isolated, one-time events were to be excluded insofar as possible.

Respondents were advised that the purpose of the questionnaire was two-fold: (1) obtain information about how certain actions actually were being performed, a fact-finding operation, and (2) ascertain the views of project engineers about the working environment and operational procedures.

[1] This notation will be used throughout the report for sources of quotations and major references. The first number is the source listed in the bibliography. The second number is the page in the reference.

Only project engineers, including Branch Chiefs, participated in the numbers shown:

Element	Number	Branch Chiefs	Total
LAP	8	3	11
MPTS	10	2	12
P&E	11	2	13
Total	29	7	36

These participants represented the majority of engineers on hand in each division as indicated:

LAP	53.8%
MPTS	60.0%
P&E	61.9%

The following data provided selected background information on the participants:*

Age	LAP	MPTS	P&E	Total	%
25**	0	1	0	1	3
25-45	7	9	6	22	61
45-Over	4	2	7	13	36
Total	11	12	13	36	100

Time With PMO	LAP	MPTS	P&E	Total	%
Under 4 Mos.	1	5	3	9	25
4 Mos-1 Yr.	5	3	4	12	33
1 Yr-Over	5	4	6	15	42
	11	12	13	36	100

*Extracted from demographic data collected (See Form, Appendex C).
**Deleted from analysis since involved only 1 engineer.

Time in Specialty	LAP	MPTS	P&E	Total	%
Under 1 Yr.	2	4	0	6	17
1 Yr. to Over 10 Yr.	9	8	13	30	83
Total	11	12	13	36	100

Educational Background	LAP	MPTS	P&E	Total	%
BS	9	6	8	23	64
MS	2	6	3	11	31
Ph.D.	0	0	0	0	0
Other	0	0	2	2	5
Total	11	12	13	36	100

Professionally Active	LAP	MPTS	P&E	Total	%***
2 or more areas: (Belong to professional organizations, attend professional meetings, etc.)	8	5	6	19	53
Present professional papers	1	3	2	6	17
Publish	0	(2)****	1	3	0
Hold Office	0	0	0	0	0

In sum, MPTS has the highest percentage of younger engineers - 61% of the total sample are in the 25-45 age category - and the largest number of engineers who have been with the PMO for more than one year. Forty-two percent of the total sample also are in this latter category. Concerning time in specialty, P&E has the greatest number in the over 10 year classification.

***Percent based on total sample of 36 engineers.
****( ) included immediately above in the 3.

For the sample as a whole, 83% are in the 1 year to over 10 year bracket. In terms of educational background, 64% of the sample possess bachelor degress and 31% have acquired the masters degree. Fifty percent of the engineers in MPTS have masters degrees. Regarding professional activities, 17% of the sample have presented professional papers, with MPTS strongly represented here; two of their engineers have publications to their credit.

From a professional standpoint, it would appear that MPTS has a marked advantage over the other two divisions.

Data Analysis

The responses from the questionnaire were coded, card-punched and computer analyzed by the program package to be described later. The computer produced means and standard deviations from the raw scores, determined the existence of significant statistical differences where comparisons were made, and constructed a graph or plot of the mean score. The results of these various analyses are discussed in Section III of this report.

Three computer programs were created especially to analyze the data collected. In conjunction with these three new programs, a standard program NPAR2, also was employed for the purpose of determining statistical differences. These programs, are the total computer package, as follows:

1 - Program QUESTAB
2 - Program NPAR2
3 - Program COMPRES
4 - Program CALPLOT

All these programs are written in FORTRAN IV for the UT2D 64/6600 computer system (CDC) at The University of Texas at Austin.

Program QUESTAB:

This program was organized to accomplish an analysis of data produced by the responses of the participants to the questionnaire (Appendix B). The questionnaire data consists of demographic variables (Appendix C) and specific responses to the 64 questions, which involves a single choice from five topics. These options present a range or frequency of activity for each of the 64 questions, extending from extremely low to extremely high. The choices or responses of all participating engineers then were subjected to a series of analyses.

Input to QUESTAB consists of a master control card, followed by the questionnaire response data and then the desired inquiring sets. Questionnaire responses to the 64 questions by individual engineers were identified by a series of seven two-digit codes, as shown:

Demographic Variable	Two-Digit Example	Category
No. 1	03	Age
No. 2	02	Time in Organization
No. 3	05	Time in Speciality
No. 4	01	Educational Background
No. 5	05	Civil Service Grade
No. 6	01	Job Status (Branch Chief or Not)
No. 7	01	Organizational Element

The following legend explains the categories used in coding the demographic data.

Legend

1. Age:

Under 25 1	45-50 4
25-35 2	Over 50 5
35-45 3	

2. Time in Organization:

4 months 1, 4 months-1 year 2, 1 year 3

3. Time in Speciality:

Under 4 months 1	5 years-10 years 4
4 months-1 year 2	Over 10 years 5
1 year-5 years 3	

4. Educational Background:

BA/BS 1	Ph.D. 3
MA/MS 2	Other 4

5. Grade:

GS-9 1	GS-12 3	GS-14 5
GS-11 2	GS-13 4	

6. Job Status:

Chief 1
No 2

7. Organizational element:

LAP 1 MPTS 2 P&E 3

In the above example, organizational element #1 and a branch chief were identified with a particular questionnaire response set. Additionally, he was in the 35-45 age bracket, had been in the organization 4 months-1 year, in the specialty over 10 years, had a BS degree, and was a GS-14.

An inquiry set includes a pair of inquiry cards and a file card. Each inquiry card involves a set of up to six restriction sets to accommodate a variety of comparison. A restriction set consists of three, two-digit numbers: a demographic variable, the lower bound of desired responses, and the upper bound of desired responses. The following example is typical of an inquiry set:

To accomplish a comparison of two groups, for instance all engineers under 4 months in the organization with their counterparts of 4 months-1 year, the inquiry set would be as indicated:

First Card	01	02	01	01	(Comparing engineers with 4 months)
Second Card	01	02	02	02	(With engineers from 4 months-1 year)

The first digit pair is the restriction designator, 01, which indicates that there is only one restriction set involved: three pairs of two-digit numbers. The initial pair of digits in the restriction set, 02, is the demographic variable. In this illustration, 02 designates the time in the organization category for analysis. The following two pairs of two digits,

01 and 01, provide the instructions that all the engineers with less than 4 months in the sample are to be selected. In similar fashion, the second card incorporated the instruction that all the engineers from 4 months-1 year in the sample are to be included for the comparative analysis.

QUESTAB produces the following analysis for an inquiry set:

1 - Table of means and standard deviations.

2 - Print plot (optional).

3 - Data file of the means for using a graphical output package with the program CALPLOT (optional).

4 - Data file for using the NPAR-2, the Mann-Whitney U test option.

As Siegel has noted, the Mann-Whitney U (MWU) test is "one of the most powerful of the nonparametric tests, and it is a most useful alternative to the parametric T test when the researcher wishes to avoid the T test's assumptions, or when the measurement in the research is weaker than internal scaling" (10:116-127). The MWU test is designed for use with small samples.

To apply the U test, it is first necessary to combine the observations or scores from two groups under examination and rank them by size. For example, the groups may have completed the same questionnaire, the answers to which are coded on some appropriate numerical basis. The value of U, the statistic used in the MWU analysis, is given by the number of times that a score in one group precedes a score in the other group. The sampling distribution under the Null hypothesis, Ho, has been previously calculated by the test designers, and thus it is possible to determine the probability, associated with the occurrence under the Null hypothesis of any U as extreme as an observed value of U.

As an illustration, the Null hypothesis, Ho, is that population A and population B have the same distribution. "The alternative hypothesis, H_1, against which we test Ho, is that A is stochastically larger than B, a directional hypothesis. We may accept H_1 if the probability that a score from A is larger than a score from B is greater than one-half. That is, if a one observation from population A, and b is one observation from population B, then H_1 is that $p(2a > b) > 1/2$. If the evidence supports H_1, this implies that the 'bulk' of population A is higher than the "bulk" of population B ... For a two-tailed test, i.e, for a predication of differences which does not state direction, H_1 would be that $p(a > b) \neq 1/2$" (10:116).

Program NPAR2

The MWU test utilized for this research is contained in NPAR2, a program that makes available some three dozen statistical tests, most of which are nonparametric, or distribution free. NPAR2 was developed by the Computer Institute of Social Science Research at Michigan State University, East Lansing, Michigan. It was adapted to the UT2D 64/6600 Computer system (CDC) at the University of Texas at Austin. All the programs described here are for the UT2D system. In QUESTAB, previously reviewed, there is a section to create the appropriate data input to facilitate the use of the MWU test. Since the output from the MWU test is considerable, it was stored on a file and subsequently compressed by a new program designed for this purpose called COMPRES. Documentation on NPAR2 is available from The College of Business Computation Center, Computer Systems Support Group, BEB 65B, University of Texas, Austin, Texas 78712.

Program COMPRES

COMPRES simply takes the output of the MWU analysis in NPAR2 and

arrays it in tabular form on one page. An example of such a display is shown on page 15. This table presents a comparison of all engineers with less than 4 months in the organization versus the engineers with 4 months - 1 year who participated in the completion of the questionnaire. For each question, the following values are computed:

1. U
2. Rank Sum
3. Probability for a one-tail test
4. Probability for a two-tail test

To determine the existence of a significant difference between the two groups under comparative analysis, at the .05 level for a two-tail test, an examiantion of the last column provides an immediate identification of those questions so involved. In this particular case, the following questions are established as involving significant differences between the two groups of engineers:

Question	Probability
8	.0111
15	.0188
27	.0415
40	.0045
41	.0011
51	.0021
53	.0029
55	.0015
58	.0202
59	.0321
62	.0023
64	.0059

Program CALPLOT:

As indicated previously, QUESTAB generates the data file which CALPLOT uses to plot a profile graph of the means of the responses to the 64 questions or tasks contained in the program management questionnaire. CALPLOT produces a finished plot automatically, with all plot points

connected by ball-point or ink pen. The option in the QUESTAB program allows the user to choose between a finished plot as provided by CALPLOT, or a larger scaled graph in which the plot points are not joined together in a continuous line. CALPLOT uses the UT 64/6600 graphical output package, which include a 763 Zip Mode Paper Plotter with the CALCOMP 111 Controller.

SECTION III

ANALYSIS OF THE DATA

This section will address the three specific attitudinal areas of (1) Characteristics of Working Environment, (2) Relationships with Superiors and (3) Basic Professional Aspects and the series of response statements associated with them. These three attitudinal areas have been enjoined with three demographic aspects for the purpose of this study. The demographic aspects are employees age, time with the organization and time in specialty.

In assessing the statement responses, each appropriate group of responses will be addressed with respect to each applicable major attitudinal area and the sub-attitudinal areas within it. From this, the analysis will be made.

The first major area, Characteristics of Working Environment, is concerned with 10 response statements designed to determine how the engineers feel about (1) the amount of work they have to do, (2) the work they are assigned, (3) work in general and (4) reports preparation. Three statements (18, 22 and 47) are associated with the amount of work, two statements (21 and 23) with work assigned, three statements (33, 54 and 58) with work in general and two (41 and 51) with reports. See Appendix E for data used in this analysis.

In assessing characteristics of the work environment with regards to the amount of work the engineers have to do, it is determined that regardless of age, time in the organization or time in speciality, they are, for the

most part, not overworked. Responses clearly indicate that the "average" engineer is confronted with an "average" or a "normal" amount of work since responses show that most engineers (a total of 71 responses of a possible 107) are within the "almost never" to "neutral" area. This surprises me since based on the discussions I've had with the engineers during my two years association with them, I had been led to believe that the responses would have indicated that they were "over burdened" most of the time. To my knowledge, discussions between Division Chiefs and the Project Manager have also indicated this to be true. It is interesting to note, however, that younger engineers and those who have been in the PM office the least amount of time and with a lesser amount of time in their specialty were more inclined to stay on the "1 to 3" side of the scale more frequently than the "3 to 5" side. I believe this is only natural, though, and will change as tenure increases. Perhaps a review of overtime requests should be made with the results of this response in mind.

In looking at the work the engineers are assigned, I am not at all surprised at the 89 out of a possible 107 total replies indicating that considerable latitude is exercised in allowing the engineers to manage their own work and that they are quite impressed with the responsibility for the engineering of a multi-billion dollar project as indicated by 80 responses of 107. In both cases, the demographic data had no adverse bearing on the replies. The responses by the majority to the "often" block of the scale should leave no doubt in anyones mind that the engineers have freedom of work determination which I believe in this case enhances a better product. I would; however, have the Division Chiefs evaluate the effectiveness of the degree

of latitude within each division to ensure that it doesn't get completely out of hand and that it is properly managed by the Division Chief. Guidance and control should be retained by the Division Chief.

Turning next to work in general, while responses indicate that other project office engineers are "above average" (resulting from the majority of the "often" replies received), there is not as quite a cut and dried analysis of statement 54 pertaining to receipt of instructions when engineers are assigned tasks to perform. The statement reads, "when assignments are given to me, my instructions are detailed and my actions are prescribed". The majority of the responses received are categorized as follows:

Age:	25 to 45 - seldom (45%) Over 45 - often (38%)
Time in Organization:	Under 4 months - often (33%) 4 months to 1 year - seldom (50%) Over 1 year - Neutral (42%)
Time in Speciality:	Under 1 year - never to seldom (67%) 1 year to over 10 years - seldom (43%)

This analysis indicates that the demographic input has an affect on the replies to the statement and that the statement was misinterpreted and should perhaps be disregarded or that the responses are indeed factual, in which case this area needs to be reviewed more closely by the Division/Branch Chiefs to determine the reason for the response spread. In any event, I would suggest that the Division Chiefs be advised to ensure through their Branch Chiefs that instructions given the engineers at the outset of a task be explicit, detailed to the extent necessary and some follow-up be accomplished, at least, initially. Maybe this will close the gap for the engineers. As for encouraging new ideas, the responses indicate that, although this is done about 87% of the time, it may not be encouraged enough. I would have thought this statement would have received a majority of replies

in the "almost always" end of the scale instead of "neutral" to "often" brackets. Again, I would recommend it be emphasized that the project continually be receptive to new ideas and that Division and Branch Chiefs encourage this action.

The engineers attitudes towards reports fall into definite categories. The younger engineers with the shortest time in their speciality and in the organization indicate that they spend an "average" amount of time on them as opposed to the older engineers who have more time in their specialty and in organization. The latter group indication that they are spending more time on reports is based on the fact that the majority of their replies were in the "often" response block. This could be due to the idea that, as "new" and younger engineers, they haven't yet determined what represents a lot or a little amount of time with respect to report preparation or that the Division or Branch Chief hasn't given them any additional report workload. Regardless of the reason for the difference in the attitudes, I recommend that the chiefs look into reports preparation to see what the distribution represents.

The second major attitudinal area covers the subject of Relationships with Supervisors and involves 8 statements, sub-grouped into two more specific areas; those responses dealing with the engineers immediate supervisors at Division and Branch level and those associated with the Deputy PM and the PM. The former group has 5 statements (17, 20, 26, 42 and 52) relative to it and the latter has 3 (30, 36 and 62). See Appendix F for data used in this analysis.

The first analysis of the engineer-superior relationships is concerned with the immediate supervisor level within the organization. The responses (over 75% favorable) reveal that regardless of the age of the engineers,

they all hold their Division and Branch Chiefs in rather high esteem and that the Chiefs are around when needed and are receptive to ideas/suggestions the engineers have. Here, there seems to be an abundance of "hygiene" factors as described by Herzberg (7:72-73). Nevertheless, the engineers seem quite satisfied with the situation.

In his book for first line supervisors, Haimann points out that "the supervisor should earnestly seek employees opinions whenever he can and should be willing to be influenced by the suggestion and even the criticism which employees may offer." He continues, "employees like to have their suggestions heard and answered; to many employees, just the mere fact that a suggestion has been accepted is worth more than the monetary award" (5:57). This would indicate, based on the 158 out of a possible 175 of the "age" responses, that the relationship is well above average and this is good since that type of association makes for a good organization. In the same vein,considering responses keyed to the demographic variables, time with the organization also points up the fact that the immediate supervisor-engineer relationship is a good one considering 163 favorable replies out of 180. Again, the majority of responses were in the "often" to "almost always" block, with the "junior" engineers spotting some responses inthe "neutral" area. The wide spread was in response to statement 42 ("whenever I need to discuss a major problem with my boss, I have difficulty finding him") where they ranged from "almost never" to "often" with approximate equal distribution. In assessing the engineers time in specialty responses, there appears to be a pattern wherein the 1 year to over 10 year group reaction was more favorable than the under 1 year group.

The 1 year to over 10 year segment responses ranged primarily from "often" to "almost always". However, the majority of the engineers place their Division and Branch Chiefs in an "above average" rating a minimum of 72% of the time.

In analyzing the engineer-Deputy PM/PM relationship, the responses aren't as favorable as I had thought they would be. The 25-45 age group majority reply (16 of 22) that they not only don't get to brief the PM and Deputy PM frequently, but 86% say their ideas aren't sought by there two top managers too frequently, either. The other two demographic data inputs, time with the organization and time in specialty seem to substantiate these results. Eighty-one percent of those engineers with 1 year or less in the organization replies ranged from "neutral" to "almost never" while 94% of the engineers with under 1 year time in specialty responded in the same ranges. Although there is an "open door" policy and regardless that it has been announced, I suggest that at the next PM office personnel meeting that it be called to everyones attention again. Also, the Division and Branch Chiefs should be informed to exploit the talents of those newer engineers via briefings whereby they present rather than the Chiefs. Maybe this will help in the area of exposing more of them to top management.

The final major area of consideration, Basic Professional Aspects considers 8 statements (4, 7, 9, 10, 12, 27, 37 and 61) that are designed to reveal the engineers attitude towards his profession as an engineer in the project office.

In answering the question, "what motivates employees to work more effectively?", Hampton replies that "it is a challenging job which allows a feeling

of achievement, responsibility, growth, advancement, enjoyment of work itself and earned recognition" (6:61). With this in mind, I am very pleased with the results of the responses to this section since they not only reflect a professional attitude but also a positive feeling that PM office work is career enchancing. Overall 95%, or 775 out of 856 responses, were in the favorable end of the scale and based on this, while considering all these demographic variables, all indications are that the "average " AMCPM-PBM engineers is one who likes to come to work, enjoys what he's doing, finds it professionally rewarding and challenging although not too difficult, likes the environment and believes he is performing a definite service. There is very little to improve on within these characteristics except to continue to encourage the engineers to pursue this attitude. The lack of deviations in responses to the statements in this area provide little data upon which to base any other conclusions except that which drawn. The overall response distribution indicates that the project engineers feel very much alike and share practically the same professional opinion regarding the project. I believe this is good from the point of view that there are no obvious adverse mavericks in the organization.

SECTION IV

CONCLUSIONS/RECOMMENDATIONS

Conclusions: The PBM project office engineer is, by and large, working in a healthy environment -- one that provides a sufficient amount of work yet allows him to conduct his activities of planning, coordinating, reviewing engineering designs, etc. with an adequate amount of time. The engineer-superior relationship is well above average, especially at Division and Branch level; however, not quite as good above that level. The "average" engineer surfaces to be one who finds himself eager to go to work each day and considers project office engineering a professionally rewarding vocation.

Recommendations:

1. Characteristics of Working Environment:

a. Ensure that the latitude currently enjoyed by project engineers in setting their own work schedule and performance is controlled by Division and Branch Chiefs and properly exercised by the engineers.

b. Division/Branch Chiefs should, upon issuance of new tasks to relatively new or junior engineers, make sure that sufficient and adequate guidance is provided.

c. A policy regarding solicitation and the interest in new ideas be prepared and disseminated to all employees.

d. Division/Branch Chiefs evaluate reports preparation assignments for purpose of spreading this task over all the engineers.

2. Relationships with Superiors: Encourage Division/Branch Chiefs to use younger engineers with less tenure to present briefings to the Deputy

PM and PM on those areas with which they are knowledgable. This face to face meeting will provide them with an awareness of what the PM expect of them as project engineers.

3. Basic Professional Aspects: Select one or two of the better prospects for attendance at DSMS in order to provide the background for advancement within the PM career field.

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APPENDIX A

PROJECT MANAGER CHARTER

MUNITION PRODUCTION BASE MODERNIZATION AND EXPANSION

I. DESIGNATION OF PROJECT MANAGER

Brigadier General Robert J. Malley was designated Department of the Army Project Manager for Munition Production Base Modernization and Expansion (MPBME) effective 18 June 1973. The Project Manager reports directly to the Commanding General, US Army Materiel Command (AMC). This is the initial charter for MPBME program and it will be reviewed annually on its anniversary date by the Project Manager to ensure currency and adequacy.

II. MISSION

The Project Manager is responsible for project management of the Munition Production Base Modernization and Expansion (MPBME) program in accordance with DOD Directive 5000.1, AR 1000-1, AR 70-17, AMCR 11-16, other regulations pertinent to the MPBME program, and Commanding General, AMC policies and procedures. He will exercise centralized management authority over the planning, direction, control, and execution of the MPBME program at all US Army Ammunition Plants and Arsenals and for government equipment located at contractor owned and operated facilities included in the MPBME program. The MPBME program assigned to the Project Manager includes modernization and expansion and Production Engineering Measures (PEM) directly associated with the MPBME program.

III. AUTHORITY AND RESPONSIBILITY

The Project Manager is the Army focal point for operational control of the MPBME program. The Corps of Engineers and AMC activities execute the MPBME program under his direction and close monitorship. The Project Manager has been delegated the full line authority of the Commanding General, AMC, for the centralized management and execution of his approved program and is responsible for:

A. Planning, directing, and controlling the allocation and utilization of all resources authorized for execution of the approved program.

B. Determination of facility requirements, development of production processes, procurement and installation of production equipment, ensuring proper surveillance and execution of construction, and supervision of test run-in and acceptance of facilities.

C. Preparation and maintenance of master plans for management of the MPBME program.

D. Technical and management decisions required by the program and authorized by this charter, including authority to exercise final design freeze on all MPBME facility projects.

E. Development of plans for accomplishment of the program. Program and project submissions and related matters requiring approval or concurrence of higher authority will follow command and staff channels.

F. Coordinating and documenting all approvals, plans and statements required relative to his assigned program.

G. Being cognizant of all actions by higher authority and other governmental agencies (Federal, State and local) having impact on his assigned program.

H. Technological forecasting and exploitation of modern manufacturing technology applicable to the MPBME program.

I. The preparation and approval, within his delegated authority of the required technical documentation pertinent to his assigned program.

J. Maintaining and monitoring environmental effects and Occupational Safety and Health Act programs pertaining to the MPBME program and assuring compliance with Army policy regarding the said program.

K. Program progress and remedial action in problem areas that have an impact on meeting performance, schedules, and other applicable requirements in the execution of the MPBME program.

L. Achieving the technical performance objectives of the MPBME program on schedule and at the lowest practicable cost.

M. Appropriate utilization of the AMC corporate and commodity laboratories in the solution of program technical problems and ensuring that program industrial contractors are fully aware of the technical resources and expertise available in these laboratories.

N. Coordination with the CG, ARMCOM to ensure that related production base support activities of annual support, layaway and MCA projects are completely compatible with the modernization and expansion program.

The Project Manager is supported by the offices and organizations within AMC and the participating organizations, identified in paragraph V.B., which are responsible to the Project Manager for the execution of specifically assigned projects.

IV. ASSIGNED PROGRAM ELEMENTS

The Project Manager is responsible for:

A. The formulation and execution of that part of Provision of Industrial Facilities (PIF) element in the Ammunition Procurement Army (APA) Production Base Support program that applies to the modernization and expansion program. This includes but is not limited to the following major project areas: propellants and explosives and related acid facilities; small caliber ammunition facilities; load assembly, and pack facilities; metal parts facilities; and pilot plants.

B. Production Engineering Measures (PEM) projects related to the MPBME program. Ammunition PEM projects under the purview of other Project Managers or activities will be coordinated with the Project Manager MPBME prior to the initiation of the related facility project.

C. Initial Production Facilities (IPF) when implemented.

D. OMA, ASF as assigned.

V. INTERFACE AGENCIES AND PARTICIPATING ORGANIZATIONS

A. INTERFACE AGENCIES

1. Assistant Secretary Defense (I&L)

2. Assistant Secretary of Army (I&L)

3. Deputy Chief of Staff Logistics

4. Defense Supply Agency

5. HQ, US Marine Corps

6. Air Force Logistics Command

7. Air Force Systems Command

8. US Naval Materiel Command

9. US Army Safeguard Systems Command

10. Other Service and DOD Project Managers

B. PARTICIPATING ORGANIZATIONS

The following organizations will participate under the direction and close monitorship of the Project Manager:

1. US Army Corps of Engineers

Performs design, administers contracts and supervises construction of MPBME projects in accordance with design criteria and specifications of the Project Manager. This does not include minor construction at Arsenals and Government Owned Contractor Operated (GOCO) Army Ammunition Plants (AAP).

2. US Army Armament Command

Provides mobilization, procurement and facilities utilization plans and contracts for major portions of the equipment required for the MPBME program. HQ, ARMCOM staff will coordinate all related production base support activities of annual support, layaway, and MCA projects with the Project Manager MPBME to assure complete compatibility with the modernization and expansion program.

3. US Army Edgewood, Frankford and Picatinny Arsenals

Provide development of processes, equipment, descriptions of manufacture and equipment technical data packages. Provide engineering support to organizations procuring, installing, and starting up new equipment built to the arsenal's designs and conduct production engineering and product improvement studies relating to the MPBME program. Picatinny Arsenal will provide the necessary facilities and administrative support for the Office of the Project Manager MPBME.

4. US Army Ammunition Plants

Provide physical execution of the MPBME program at the GOCO AAP.

5. US Army Pine Bluff and Rocky Mountain Arsenals

Provide the physical execution of the MPBME program at the arsenal.

6. US Army Materiel Command Installations and Services Agency

Performs technical review of construction criteria, plans and specifications; reviews proposed projects on-site for adequacy, suitability, and completeness; provides technical assistance; and conducts design and construction surveillance.

7. US Army Production Equipment Agency (PEQUA)

Reviews replacement of plant equipment, provides services for on-site review of projects, provides independent economic analysis, provides special reports and studies and reviews projects developed by the Project Manager MPBME.

8. Other AMC Major Subordinate Commands, Separate Activities and Project Managers

Apprise the Project Manager MPBME of developments and changes in their programs as they affect the MPBME program requirements. PEM and facility projects relating to the MPBME and under the purview of other Project Managers or activities will be coordinated with the Project Manager MPBME.

VI. COMMUNICATION CHANNELS

A. The Project Manager has a direct channel of communication to the Commanding General, AMC, the Chief of Staff, Army, and the Secretary of the Army, should any of the participating organizations fail to respond to program requirements in any of the several management areas.

B. Direct communication is authorized between all interface and participating organizations involved in implementation and execution of the approved MPBME program to assure timely and effective direction and interchange of information.

C. On policy matters, the Project Manager will follow established command channels in communicating with the Office of the Secretary of the Army, Office of the Chief of Staff, Army, interface agencies, or participating organizations not part of DA.

VII. RESOURCE CONTROL

A. Army resources approved to accomplish the above responsibilities will be provided to the Project Manager through Headquarters, AMC and ARMCOM.

B. The Project Manager within his delegated authority is responsible for:

1. Approving individual projects within his approved MPBME program.

2. Acquiring and compiling budget data for assigned program and justifying program budget to higher headquarters.

3. Reviewing and evaluating higher echelon program and resource plans and issuing program/budget guidance and direction for program development and execution to action agencies.

4. Controlling and directing release of program and funds to supporting activities.

5. Authorizing reprogramming action; exercising approval authority over program change requests; participating in preparation of program change proposals and ensuring return or realignment of excess program authority and funds.

6. Controlling the unapplied reserve account for the MPBME program.

7. Insuring that program costs are minimized through cost control, change control, contractual enforcement, and contractor motivation. In the execution of this responsibility, as applicable, he will maintain continual surveillance of the variance between planned cost of the work performed and actual cost for that work to detect and ameliorate incipient cost growth, and he will insure that project changes are analyzed for life cycle cost impact prior to execution.

C. The staff of the Project Manager is the source of personnel to perform management and execution functions in the areas of personnel, training, human factors engineering, program and procurement management, process engineering, configuration management, product assurance and test, facility planning, and economic, risk and cost analysis.

VIII. LOCATION AND SUPPORT

The Project Manager's Office is located at Picatinny Arsenal, Dover, New Jersey, with necessary facilities and administrative support being provided by that command. Field offices may be created by the Project Manager as required without change of charter with necessary facilities and administrative support being provided by the command/ activity where established.

IX. TRANSITION

Long range plans for the MPBS program indicate a requirement for project management through Fiscal Year 1981. Six months prior to scheduled phase out, a transition agreement will be negotiated with the US Army Armaments Command to identify the appropriate managers who will assume responsibility for the various program elements.

X. SPECIAL EXEMPTIONS

None

XI. SPECIAL DELEGATIONS

None

APPROVED Howard H Calloway DATE 3 SEP 1973

APPENDIX B

FREQUENCY OF OCCURRENCE

SCALE:	Almost Never	Seldom	Neutral	Often	Almost Always
	1	2	3	4	5

1. My job requires me to travel.

2. The working environment facilitates a consideration and appreciation of the "Big Picture" of the modernization program, and the important relationships of all the projects that comprise it.

3. It is easy to justify the selection process for the projects that are in the program on sound technological and economic reasons.

4. The other engineers with whom I associate in the Office of the PM are dedicated and enthusiastic.

5. Most of the actions we take here in reviewing projects are of the "rubber-stamp" nature.

6. The basis for workload distribution is valid and well-understood.

7. My work is unusually difficult in terms of the technical demands and its complexity.

8. There is an inspiring "team" spirit throughout the Office of the PM.

9. I decide on how my time and effort is apportioned and when.

10. I look forward to coming to work.

11. The working relationship with the other engineering divisions is close.

12. I read professional journals and other related data so that I can keep informed of technological trends.

13. My boss is on travel more than I am.

14. The authority and responsibility relationships between my divisions and the Program Management Division are sound.

15. Overall, the reports I get, such as the 101 Report, are essential for the accomplishment of my job. They are exactly what I need, timely and accurate.

16. I am satisfied that I have enough contacts with private industry to keep up with the latest manufacturing technology.

SCALE:	Almost Never	Seldom	Neutral	Often	Almost Always
	1	2	3	4	5

17. My superiors are unusually receptive to new ideas.

18. I am overloaded.

19. I participate in briefings to top officials, such as the PM, on the status of my projects.

20. My views are sought by my immediate superior.

21. I have considerable latitude in deciding how to manage my work.

22. I am taxed to the very limits of my ability.

23. I am impressed with the importance of my work.

24. I am encouraged to try to relate "my" projects to similar projects of other project engineers in the same or other plants.

25. I work alone.

26. I have the opportunity to present my views to my superiors.

27. I feel my job is enhancing my professional stature.

28. There is an inspiring "team" spirit in my division.

29. I have had to devise my "own" reports in order to do my job properly.

30. I personally present status briefings on my projects to top officials, such as the PM.

31. In my particular office, work is well coordinated and integrated.

32. Decisions regarding the priority of MM&T projects are negotiated in local conferences based on the preferences of the Deputy PM or the PM.

33. The other engineers in the Office of the PM are efficient and effective.

34. The workload for project engineers is equitably distributed.

35. I make decisions on the assignment of priorities to projects.

36. My views are sought by the PM.

37. I feel challenged and stimulated by my job.

38. "My" projects originate in either an arsenal or a GOCO facility.

SCALE:	Almost Never	Seldom	Neutral	Often	Almost Always
	1	2	3	4	5

39. I have adequate time to consider the relationship of "my" projects to the entire plant, groups of plants involved in similar activities, where another project engineer also may have other projects under study.

40. The organizational structure is conducive to efficient performance.

41. The time I have to spend on preparing reports is excessive.

42. Whenever I need to discuss a major problem with my boss, I have difficulty finding him.

43. I am exhilarated by the opportunity of working in an organization that is the focal pace-setter and originator of advancing the state of the art in munitions manufacturing technology.

44. I work closely with other project engineers.

45. I confer with the PM about my work.

46. I supervise the work of other project engineers.

47. My work keeps me so busy I don't have time to consider what other project engineers are doing.

48. I have the opportunity to compare MM&T proposals from arsenals with manufacturing processes in private industry (not GOCO).

49. The arsenals and the GOCO plants look to us for the identification of problems and the lead in focusing attention on the particular technology most likely to solve them.

50. I am required to try to relate "my" projects to similar projects of other project engineers in the same or other plants.

51. I spend more time filling out reports, attending meetings and preparing for briefings than I do on studying my projects.

52. My views are sought by my division chief.

53. I work on teams or task forces.

54. When assignments are given to me, my instructions are detailed and my actions are prescribed.

55. I work with members of the Program Management Division.

56. My MM&T projects represent the best in state-of-the-art terms.

SCALE:	Almost Never	Seldom	Neutral	Often	Almost Always
	1	2	3	4	5

57. The Office of the PM is the principal or primary catalyst for the innovations in the modernization program.

58. New ideas are encouraged from everyone.

59. Overall, the modernization program of the Office of the PM is a closely-knit, well-coordinated and integrated package.

60. I work with members of the other divisions.

61. I am satisfied with the present working environment as pertains to my opportunities for independent decision-making.

62. My views are sought by the Deputy PM.

63. The time I spend on MM&T projects is about right.

64. I spend more time on facilities projects than on MM&T projects.

APPENDIX C

QUESTIONNAIRE

1. AGE:

Under 25: ____
25-35: ____
36-45: ____
45-50: ____
Over 50: ____

2. SEX: M: ____ F: ____

3. MARITAL STATUS: MARRIED: ____ NOT MARRIED: ____

4. TIME WITH THIS ORGANIZATION:

Under 4 MOS: ____ 4 MOS-1 YR: ____ Over 1 YR: ____

5. TIME WORKED IN THIS SPECIALTY (MANUFACTURE OF AMMO):

Under 4 MOS: ____
4 MOS-1 YR: ____
1 YR-5 YR: ____
5 YR-10 YR: ____
Over 10 YR: ____

6. PROFESSIONAL ACTIVITIES (PRESENT OR PAST):

Belong to Professional Associations : ____
Attend Professional Conferences : ____
Present Professional Papers : ____
Publish Articles in Professional Journals : ____
Hold Offices in Professional Organizations: ____

7. EDUCATIONAL BACKGROUND:

Bachelor's Degree: ____
Master's Degree : ____
Ph.D. : ____
Other (Specify): ____

8. HOBBIES:

Photography : ____
Stamp/Coin Colls.: ____
Bird Watching : ____
Painting : ____
Model Building : ____
Furniture Repair: ____
Gardening : ____
Auto Restoration: ____
Writing : ____
Other (Specify) : ____

9. ATHLETIC ACTIVITY:

Golf : ____
Tennis: ____
Swimming: ____
Bowling : ____
Squash/Handball: ____
Boating/Sailing: ____
Walking/Running: ____
Other (Specify): ____

10. GRADE OF PRESENT POSITION: _____

11. RATE IN ORDER OF IMPORTANCE TO YOU: (#1 Being the most important, etc.)

Reputation	: ____	Self-reliance	: ____	Authority:	____
Achievements:	____	Service to Others:	____	Drive	: ____
(Integrity) :	____				

12. TIME SPENT READING OFF-DUTY: (To total 100%)

Books-Fiction	: ____	Professional Journals:	____
Books-Non-Fiction	: ____	Technical Reports	: ____
Newspapers & News Magazines:	____	Other (Specify)	: ____

13. COMMENTS (SPECIAL SKILLS, EXPERIENCES, ACCOMPLISHMENTS):

APPENDIX D

CLASSIFICATION OF QUESTIONS BY SELECTED CATEGORIES

Characteristics of Program Management

2. The working environment facilitates a consideration and appreciation of the "Big Picture" of the modernization program, and the important relationships of all the projects that comprise it.

3. It is easy to justify the selection process for the projects that are in the program on sound technological and economic reasons.

5. Most of the actions we take here in reviewing projects are of the "rubber-stamp" nature.

14. The authority and responsibility relationships between my division and the Program Management Division are sound.

24. I am encouraged to try to relate "my" projects to similar projects of other project engineers in the same or other plants.

35. I make decisions on the assignment of priorities to projects.

38. "My" projects originate in either an arsenal or a GOCO facility.

39. I have adequate time to consider the relationship of "my" projects to the entire plant, groups of plants involved in similar activities, where another project engineer also may have other projects under study.

40. The organizational structure is conducive to efficient performance.

57. The Office of the PM is the principal or primary catalyst for the innovations in the modernization program.

59. Overall, the modernization program of the Office of the PM is a closely-knit well-coordinated and integrated package.

Characteristics of Working Environment

18. I am overloaded.

21. I have considerable latitude in deciding how to manage my work.

22. I am taxed to the very limits of my ability.

23. I am impressed with the importance of my work.

33. The other engineers in the Office of the PM are efficient and effective.

41. The time I have to spend on preparing reports is excessive.

47. My work keeps me so busy I don't have time to consider what other project engineers are doing.

51. I spend more time filling out reports, attending meetings and preparing for briefings than I do on studying my projects.

54. When assignments are given to me, my instructions are detailed and my actions are prescribed.

58. New ideas are encouraged from everyone.

Teamwork

8. There is an inspiring "team" spirit throughout the Office of the PM.

11. The working relationship with the other engineering divisions is close.

25. I work alone.

28. There is an inspiring "team" spirit in my division.

31. In my particular office, work is well coordinated and integrated.

44. I work closely with other project engineers.

50. I am required to try to relate "my" projects to similar projects of other project engineers in the same or other plants.

53. I work on teams or task forces.

55. I work with members of the Program Management Division.

60. I work with members of the other divisions.

Basic Working Procedures

1. My job requires me to travel.

6. The basis for workload distribution is valid and well-understood.

13. My boss is on travel more than I am.

15. Overall, the reports I get, such as the 101 Report, are essential for the accomplishment of my job. They are exactly what I need, timely and accurate.

19. I participate in briefings to top officials, such as the PM, on the status of my projects.

29. I have had to devise my "own" reports in order to do my job properly.

34. The workload for project engineers is equitably distributed.

46. I supervise the work of other project engineers.

Relationships With Superiors

17. My superiors are unusually receptive to new ideas.

20. My views are sought by my immediate superior.

26. I have the opportunity to present my views to my superiors.

30. I personally present status briefings on my projects to top officials, such as the PM.

36. My views are sought by the PM.

42. Whenever I need to discuss a major problem with my boss, I have difficulty finding him.

52. My views are sought by my division chief.

62. My views are sought by the Deputy PM.

Basic Professional Aspects

4. The other engineers with whom I associate in the Office of the PM are dedicated and enthusiastic.

7. My work is unusually difficult in terms of the technical demands and its complexity.

9. I decide on how my time and effort is apportioned and when.

10. I look forward to coming to work.

12. I read professional journals and other related data so that I can keep informed of technological trends.

27. I feel my job is enhancing my professional stature.

37. I feel challenged and stimulated by my job.

61. I am satisfied with the present working environment as pertains to my opportunities for independent decision-making.

MM&T

16. I am satisfied that I have enough contacts with private industry to keep up with the latest manufacturing technology.

32. Decisions regarding the priority of MM&T projects are negotiated in local conferences based on the preferences of the Deputy PM or the PM.

43. I am exhilarated by the opportunity of working in an organization that is the focal pace-setter and originator of advancing the state of the art in munitions manufacturing technology.

48. I have the opportunity to compare MM&T proposals from arsenals with manufacturing processes in private industry (not GOCO).

49. The arsenals and the GOCO plants look to us for the identification of problems and the lead in focusing attention on the particular technology most likely to solve them.

56. My MM&T projects represent the best in state-of-the-art terms.

63. The time I spend on MM&T projects is about right.

64. I spend more time of facilities projects than on MM&T projects.

APPENDIX E

II. CHARACTERISTICS OF WORKING ENVIRONMENT

1. Age of Engineers: (A) 25 - 45 (B) Over 45

2. Number of Engineers: (A) 22 (B) 13

18. I am overloaded.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	3	0	4	2	9	5	5	4	1	2
Cumulative Frequency	3	0	7	2	16	7	21	11	22	13

21. I have considerable latitude in deciding how to manage my work.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	0	1	0	1	3	14	8	5	2
Cumulative Frequency	1	0	2	0	3	3	17	11	22	13

22. I am taxed to the very limits of my ability.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	4	1	6	7	9	1	2	4	1	0
Cumulative Frequency	4	1	10	8	19	9	21	13	22	13

23. I am impressed with the importance of my work.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	3	1	4	1	13	7	2	4
Cumulative Frequency	0	0	3	1	7	2	20	9	22	13

33. The other engineers in the Office of the PM are efficient and effective.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	0	8	3	11	9	3	1
Cumulative Frequency	0	0	0	0	8	3	19	12	22	13

41. The time I have to spend on preparing reports is excessive.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	3	4	2	2	7	1	8	6	2	0
Cumulative Frequency	3	4	5	6	12	7	20	13	22	13

47. My work keeps me so busy I don't have time to consider what other engineers are doing.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	3	2	7	7	7	1	3	3	2	0
Cumulative Frequency	3	2	10	9	17	10	20	13	22	13

51. I spend more time filling out reports, attending meetings and preparir for briefings than I do on studying my projects.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	1	6	2	8	4	6	6	1	0
Cumulative Frequency	1	1	7	3	15	7	21	13	22	13

54. When assignments are given to me, my instructions are detailed and my actions are prescribed.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	3	2	10	2	6	3	3	5	0	1
Cumulative Frequency	3	2	13	4	19	7	22	12	22	13

58. New ideas are encouraged from everyone.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	1	2	8	5	9	3	5	3
Cumulative Frequency	0	0	1	2	9	7	17	10	22	13

1. Time with Organization: (A) Under 4 mos (B) 4 mos to 1 yr (C) Over 1 yr

2. Number of Engineers: (A) 9 (B) 12 (C) 15

18. I am overloaded.

	1			2			3			4			5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Frequency	2	0	1	3	2	1	3	6	6	1	3	5	0	1	2
Cumulative Frequency	2	0	1	5	2	2	8	8	8	9	11	13	9	12	15

21. I have considerable latitude in deciding how to manage my work.

	1			2			3			4			5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Frequency	0	0	1	0	0	1	0	1	3	6	8	9	3	3	1
Cumulative Frequency	0	0	1	0	0	2	0	1	5	6	9	14	9	12	15

22. I am taxed to the very limits of my ability.

	1			2			3			4			5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Frequency	2	1	2	3	4	6	3	4	4	1	2	3	0	1	0
Cumulative Frequency	2	1	2	5	5	8	8	9	12	9	11	15	9	12	15

23. I am impressed with the importance of my work.

	Almost Never			Seldom			Neutral			Often			Almost Always		
	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	5 B	C
Frequency	0	0	0	0	2	2	2	2	1	7	6	8	0	2	4
Cumulative Frequency	0	0	0	0	2	2	2	4	3	9	10	11	9	12	15

33. The other engineers in the Office of the PM are efficient and effective.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	5 B	C
Frequency	0	0	0	0	0	0	2	3	6	6	8	7	1	1	2
Cumulative Frequency	0	0	0	0	0	0	2	3	6	8	11	13	9	12	15

41. The time I have to spend on preparing reports is excessive.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	5 B	C
Frequency	3	1	3	3	0	2	3	3	2	0	7	7	0	1	1
Cumulative Frequency	3	1	3	6	1	5	9	4	7	9	11	14	9	12	15

47. My work keeps me so busy I don't have time to consider what other engineers are doing.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	5 B	C
Frequency	2	2	1	5	3	7	2	3	3	0	2	4	0	2	0
Cumulative Frequency	2	2	1	7	5	8	9	8	11	9	10	15	9	12	15

51. I spend more time filling out reports, attending meetings and preparir for briefings than I do on studying my projects.

	Almost Never			Seldom			Neutral			Often			Almost Always		
	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	2	0	0	5	2	1	2	4	7	0	5	7	0	1	0
Cumulative Frequency	2	0	0	7	2	1	9	6	8	9	11	15	9	12	15

54. When assignments are given to me, my instructions are detailed and my actions are prescribed.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	1	2	2	2	6	4	2	2	5	3	2	3	1	0	1
Cumulative Frequency	1	2	2	3	8	6	5	10	11	8	12	14	9	12	15

58. New ideas are encouraged from everyone.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	0	0	0	0	0	3	0	5	7	4	5	4	5	2	1
Cumulative Frequency	0	0	0	0	0	3	0	5	10	4	10	14	9	12	15

1. Time in Specialty: (A) Under 1 Yr (B) 1 Yr to Over 10 Yrs
2. Number of Engineers: (A) 6 (B) 30

18. I am overloaded.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	2	3	3	1	14	0	9	1	2
Cumulative Frequency	1	2	4	5	5	19	5	28	6	30

21. I have considerable latitude in deciding how to manage my work.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	1	0	1	1	3	4	19	1	6
Cumulative Frequency	0	1	0	2	1	5	5	24	6	30

22. I am taxed to the very limits of my ability.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	4	2	11	2	9	0	6	1	0
Cumulative Frequency	1	4	3	15	5	24	5	30	6	30

23. I am impressed with the importance of my work.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1 B		A 2 B		A 3 B		A 4 B		A 5 B	
Frequency	0	0	1	3	3	2	2	19	0	6
Cumulative Frequency	0	0	1	3	4	5	6	24	6	30

33. The other engineers in the Office of the PM are efficient and effective.

	A 1 B		A 2 B		A 3 B		A 4 B		A 5 B	
Frequency	0	0	0	0	3	8	2	19	1	3
Cumulative Frequency	0	0	0	0	3	8	5	27	6	30

41. The time I have to spend on preparing reports is excessive.

	A 1 B		A 2 B		A 3 B		A 4 B		A 5 B	
Frequency	1	6	2	3	2	6	0	14	1	1
Cumulative Frequency	1	6	3	9	5	15	5	29	6	30

47. My work keeps me so busy I don't have time to consider what other engineers are doing.

	A 1 B		A 2 B		A 3 B		A 4 B		A 5 B	
Frequency	2	3	2	13	1	7	0	6	1	1
Cumulative Frequency	2	3	4	16	5	23	5	29	6	30

51. I spend more time filling out reports, attending meetings and preparin for briefings than I do on studying my projects.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	2	2	6	3	10	0	12	1	0
Cumulative Frequency	0	2	2	8	5	18	5	30	6	30

54. When assignments are given to me, my instructions are detailed and my actions are prescribed.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	4	2	10	1	8	1	7	1	1
Cumulative Frequency	1	4	3	14	4	22	5	29	6	30

58. New ideas are encouraged from everyone.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	3	1	11	4	9	1	7
Cumulative Frequency	0	0	0	3	1	14	5	23	6	30

APPENDIX F

V. RELATIONSHIPS WITH SUPERIORS

1. Age of Engineers: (A) 25 - 45 (B) Over 45

2. Number of Engineers: (A) 22 (B) 13

17. My superiors are unusually receptive to new ideas.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	0	1	0	5	2	11	8	4	3
Cumulative Frequency	1	0	2	0	7	2	18	10	22	13

20. My views are sought by my immediate superior.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	1	6	1	9	10	7	1
Cumulative Frequency	0	0	0	1	6	2	15	12	22	13

26. I have the opportunity to present my views to my superiors.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	1	1	1	12	3	9	8
Cumulative Frequency	0	0	0	1	1	2	13	5	22	13

30. I personally present status briefings on my projects to top officials such as the PM.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	7	2	6	4	3	5	4	1	2	1
Cumulative Frequency	7	2	13	6	16	11	20	12	22	13

36. My views are sought by the PM.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	6	2	5	5	7	3	4	3	0	0
Cumulative Frequency	6	2	11	7	18	10	22	13	22	13

42. Whenever I need to discuss a major problem with my boss, I have difficulty finding him.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	7	6	7	2	4	3	3	2	1	0
Cumulative Frequency	7	6	14	8	18	11	21	13	22	13

52. My views are sought by my division chief.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	2	0	3	2	7	3	9	6	1	2
Cumulative Frequency	2	0	5	2	12	5	21	11	22	13

62. My views are sought by the Deputy PM.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	7	3	8	4	5	4	2	1	0	1
Cumulative Frequency	7	3	15	7	20	11	22	12	22	13

Time With Organization: (A) Under 4 Mos (B) 4 mos to 1 yr (C) Over 1 yr

Number of Engineers: (A) 9 (B) 12 (C) 15

17. My superiors are unusually receptive to new ideas.

	A	1 B	C	A	2 B	C	A	B 3	C	A	B 4	C	A	B 5	C
Frequency	0	0	1	0	1	0	0	3	4	6	5	8	3	3	2
Cumulative Frequency	0	0	1	0	1	1	0	4	5	6	9	13	9	12	15

20. My views are sought by my immediate superior.

	A	1 B	C	A	2 B	C	A	B 3	C	A	B 4	C	A	B 5	C
Frequency	0	0	0	0	0	1	3	2	2	3	6	10	3	4	2
Cumulative Frequency	0	0	0	0	0	1	3	2	3	6	8	13	9	12	15

26. I have the opportunity to present my views to my superiors.

	A	1 B	C	A	2 B	C	A	3 B	C	A	B 4	C	A	B 5	C
Frequency	0	0	0	0	0	1	0	1	1	3	7	5	6	4	8
Cumulative Frequency	0	0	0	0	0	1	0	1	2	3	8	7	9	12	15

30. I personally present status briefings on my projects to top officials such as the PM.

	Almost Never			Seldom			Neutral			Often			Almost Always		
	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	0	5	4	4	3	3	3	1	5	1	2	2	1	1	1
Cumulative Frequency	0	5	4	4	8	7	7	9	12	8	11	14	9	12	15

36. My views are sought by the PM.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	2	3	3	2	2	6	3	5	3	2	2	3	0	0	0
Cumulative Frequency	2	3	3	4	5	9	7	10	12	9	12	15	9	12	15

42. Whenever I need to discuss a major problem with my boss, I have difficulty finding him.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	6	4	4	3	3	3	0	4	3	0	1	4	0	0	1
Cumulative Frequency	6	4	4	9	7	7	9	11	10	9	12	14	9	12	15

52. My views are sought by my division chief.

	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	B 5	C
Frequency	0	1	1	0	2	3	4	1	5	5	7	4	0	1	2
Cumulative Frequency	0	1	1	0	3	4	4	4	9	9	11	13	9	12	15

62. My views are sought by the Deputy PM.

	Almost Never			Seldom			Neutral			Often			Almost Always		
	A	1 B	C	A	2 B	C	A	3 B	C	A	4 B	C	A	5 B	C
Frequency	7	1	3	1	4	7	1	4	4	0	3	0	0	0	1
Cumulative Frequency	7	1	3	8	5	10	9	9	14	9	12	14	9	12	15

1. Time in Specialty: (A) Under 1 Yr (B) 1 Yr to Over 10 Yrs

2. Number of Engineers: (A) 6 (B) 30

17. My superiors are unusually receptive to new ideas.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	1	0	1	2	5	2	17	2	6
Cumulative Frequency	0	1	0	2	2	7	4	24	6	30

20. My views are sought by my immediate superior.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	1	4	3	0	19	2	7
Cumulative Frequency	0	0	0	1	4	4	4	23	6	30

26. I have the opportunity to present my views to my superiors.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	1	0	2	3	12	3	15
Cumulative Frequency	0	0	0	1	0	3	3	15	6	30

30. I personally present status briefings on my projects to top officials such as the PM.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	8	2	8	2	7	1	4	0	3
Cumulative Frequency	1	8	3	16	5	23	6	27	6	30

36. My views are sought by the PM.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	8	3	7	3	8	0	7	0	0
Cumulative Frequency	0	8	3	15	6	23	6	30	6	30

42. Whenever I need to discuss a major problem with my boss, I have difficulty finding him.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	2	12	3	6	1	6	0	5	0	1
Cumulative Frequency	2	12	5	18	6	24	6	29	6	30

52. My views are sought by my division chief.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	2	1	4	2	8	3	13	0	3
Cumulative Frequency	0	2	1	6	3	14	6	27	6	30

62. My views are sought by the Deputy PM.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	3	8	3	9	0	9	0	3	0	1
Cumulative Frequency	3	8	6	17	6	26	6	29	6	30

APPENDIX G

VI. BASIC PROFESSIONAL ASPECTS

1. Age of Engineers (A) 25 - 45 (B) Over 45

2. Number of Engineers (A) 22 (B) 13

4. The other engineers with whom I associate in the Office of the PM are dedicated and enthusiastic.

	1		2		3		4		5	
	A	B	A	B	A	B	A	B	A	B
Frequency	0	0	0	0	3	2	10	8	9	3
Cumulative Frequency	0	0	0	0	3	2	13	10	22	13

7. My work is unusually difficult in terms of the technical demands and its complexity.

	1		2		3		4		5	
	A	B	A	B	A	B	A	B	A	B
Frequency	1	1	11	6	7	4	3	2	0	0
Cumulative Frequency	1	1	12	7	19	11	22	13	22	13

9. I decide on how my time and effort is apportioned and when.

	1		2		3		4		5	
	A	B	A	B	A	B	A	B	A	B
Frequency	2	0	1	1	2	3	13	7	4	2
Cumulative Frequency	2	0	3	1	5	4	18	11	22	13

10. I look forward to coming to work.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	2	0	6	3	9	5	5	5
Cumulative Frequency	0	0	2	0	8	3	17	8	22	13

12. I read professional journals and other related data so that I can keep informed of technological trends.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	0	4	3	5	2	11	6	1	2
Cumulative Frequency	1	0	5	3	10	5	21	11	22	13

27. I feel my job is enhancing my professional stature.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	1	0	5	5	13	5	3	3
Cumulative Frequency	0	0	1	0	6	5	19	10	22	13

37. I feel challenged and stimulated by my job.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	2	0	7	1	12	8	1	4
Cumulative Frequency	0	0	2	0	9	1	21	9	22	13

61. I am satisfied with the present working environment as pertains to my opportunities for independent decision-making.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	4	1	6	4	7	4	5	4
Cumulative Frequency	0	0	4	1	10	5	17	9	22	13

1. Time with Organization: (A) Under 4 Mos (B) 4 Mos to 1 Yr (C) Over 1 Yr

2. Number of Engineers: (A) 9 (B) 12 (C) 15

4. The other engineers with whom I associate in the Office of the PM are dedicated and enthusiastic.

	1 A	1 B	1 C	2 A	2 B	2 C	3 A	3 B	3 C	4 A	4 B	4 C	5 A	5 B	5 C
Frequency	0	0	0	0	0	0	0	1	4	4	7	8	5	4	3
Cumulative Frequency	0	0	0	0	0	0	0	1	4	4	8	12	9	12	15

7. My work is unusually difficult in terms of the technical demands and its complexity.

	1 A	1 B	1 C	2 A	2 B	2 C	3 A	3 B	3 C	4 A	4 B	4 C	5 A	5 B	5 C
Frequency	1	0	1	5	4	8	3	5	4	0	3	2	0	0	0
Cumulative Frequency	1	0	1	6	4	9	9	9	13	9	12	15	9	12	15

9. I decide on how my time and effort is apportioned and when.

	1 A	1 B	1 C	2 A	2 B	2 C	3 A	3 B	3 C	4 A	4 B	4 C	5 A	5 B	5 C
Frequency	0	1	1	0	0	2	1	2	3	7	6	7	1	3	2
Cumulative Frequency	0	1	1	0	1	3	1	3	6	8	9	13	9	12	15

10. I look forward to coming to work.

	Almost Never			Seldom			Neutral			Often			Almost Always		
	A	B 1	C	A	B 2	C	A	B 3	C	A	B 4	C	A	B 5	C
Frequency	0	0	0	0	1	1	2	3	4	3	4	8	4	4	2
Cumulative Frequency	0	0	0	0	1	1	2	4	5	5	8	13	9	12	15

12. I read professional journals and other related data so that I can keep informed of technological trends.

	A	B 1	C	A	B 2	C	A	B 3	C	A	B 4	C	A	B 5	C
Frequency	0	1	0	0	3	4	2	2	4	7	5	5	0	1	2
Cumulative Frequency	0	1	0	0	4	4	2	6	8	9	11	13	9	12	15

27. I feel my job is enhancing my professional stature.

	A	B 1	C	A	B 2	C	A	B 3	C	A	B 4	C	A	B 5	C
Frequency	0	0	0	1	0	0	0	5	5	3	6	9	5	1	1
Cumulative Frequency	0	0	0	1	0	0	1	5	5	4	11	14	9	12	15

37. I feel challenged and stimulated by my job.

	A	B 1	C	A	B 2	C	A	B 3	C	A	B 4	C	A	B 5	C
Frequency	0	0	0	2	0	0	0	5	3	4	6	10	3	1	2
Cumulative Frequency	0	0	0	2	0	0	2	5	3	6	11	13	9	12	15

61. I am satisfied with the present working environment as pertains to my opportunities for independent decision-making.

	Almost Never 1			Seldom 2			Neutral 3			Often 4			Almost Always 5		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Frequency	0	0	0	0	2	3	2	1	7	3	5	3	4	4	2
Cumulative Frequency	0	0	0	0	2	3	2	3	10	5	8	13	9	12	15

1. Time in Specialty: (A) Under 1 Yr (B) 1 Yr to Over 10 Yrs

2. Number of Engineers: (A) 6 (B) 30

4. The other engineers with whom I associate in the Office of the PM are dedicated and enthusiastic.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	0	0	0	0	1	4	3	16	2	10
Cumulative Frequency	0	0	0	0	1	4	4	20	6	30

7. My work is unusually difficult in terms of the technical demands and its complexity.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	1	3	14	2	10	0	5	0	0
Cumulative Frequency	1	1	4	15	6	25	6	30	6	30

9. I decide on how my time and effort is apportioned and when.

	A 1	B	A 2	B	A 3	B	A 4	B	A 5	B
Frequency	1	1	0	2	1	5	4	16	0	6
Cumulative Frequency	1	1	1	3	2	8	6	24	6	30

10. I look forward to coming to work.

	Almost Never		Seldom		Neutral		Often		Almost Always	
	1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Frequency	0	0	1	1	2	7	3	12	0	10
Cumulative Frequency	0	0	1	1	3	8	6	20	6	30

12. I read professional journals and other related data so that I can keep informed of technological trends.

	1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Frequency	1	0	0	7	3	5	2	15	0	3
Cumulative Frequency	1	0	1	7	4	12	6	27	6	30

27. I feel my job is enhancing my professional stature.

	1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Frequency	0	0	1	0	2	8	2	16	1	6
Cumulative Frequency	0	0	1	0	3	8	5	24	6	30

37. I feel challenged and stimulated by my job.

	1 A	1 B	2 A	2 B	3 A	3 B	4 A	4 B	5 A	5 B
Frequency	0	0	2	0	2	6	1	19	1	5
Cumulative Frequency	0	0	2	0	4	6	5	25	6	30

61. I am satisfied with the present working environment as pertains to my opportunities for independent decision-making.

	Almost Never 1		Seldom 2		Neutral 3		Often 4		Almost Always 5	
	A	B	A	B	A	B	A	B	A	B
Frequency	0	0	1	4	1	9	2	9	2	8
Cumulative Frequency	0	0	1	4	2	13	4	22	6	30