

AD-A039 722

DEFENSE SYSTEMS MANAGEMENT SCHOOL FORT BELVOIR VA
CLARITY INDICES OF SELECTED DIRECTIVES ISSUED WITHIN THE DOD AF--ETC(U)
NOV 73 E D BASHORE

F/G 5/1

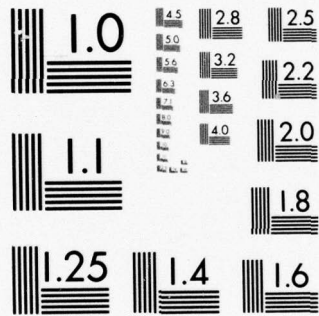
UNCLASSIFIED

NL

| OF |
AD
A039722



END
DATE
FILMED
6-77



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

2

DEFENSE SYSTEMS MANAGEMENT SCHOOL



ADA 039722

Program Management Course Student Study Program

CLARITY INDICES OF SELECTED DIRECTIVES
ISSUED WITHIN THE DOD AFFECTING
PROJECT MANAGERS
STUDY REPORT
PMC 73-2

Ellsworth D. Bashore
GS-15 DNC

AD NO.
DDC FILE COPY

DDC
RECEIVED
MAY 23 1973
B

Fort Belvoir, Virginia 22060

DISTRIBUTION STATEMENT A
Approved for public release
Distribution Unlimited

BASHORE

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) CLARITY INDICES OF SELECTED DIRECTIVES ISSUED WITHIN THE DOD AFFECTING PROJECT MANAGERS		5. TYPE OF REPORT & PERIOD COVERED Student Project Report 73-2
7. AUTHOR(s) ELLSWORTH D. BASHORE		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS DEFENSE SYSTEMS MANAGEMENT COLLEGE FT. BELVOIR, VA 22060		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS DEFENSE SYSTEMS MANAGEMENT COLLEGE FT. BELVOIR, VA 22060		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Etc		12. REPORT DATE 73-2
		13. NUMBER OF PAGES 34
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) UNLIMITED		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) SEE ATTACHED SHEET		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) SEE ATTACHED SHEET		

DEFENSE SYSTEMS MANAGEMENT SCHOOL

STUDY TITLE:

Clarity Indices of Selected Directives Issued within the DOD Affecting Project Managers

STUDY PROBLEM/QUESTION:

How clear (by recognized indices) are directives which affect Project Managers and does their clarity correlate with rankings by Project Managers?

STUDY REPORT ABSTRACT:

The Gunning Fog Index (FI) is applied to 19 directives, instructions, military standards, regulations, etc., in the functional areas of Project Management, Systems Engineering, Integrated Logistics Support, System Safety, Human Factors/Engineering, Cost/Schedule Control Systems Criteria, and Reliability/Maintainability. Indices ranging from 19.7 to 26.7 are found. Such high indices are considerably above what Gunning recommends as an index of clear writing (17 for a college graduate). Results of questionnaires on the same areas returned by PMs suggest some correlation of their opinions regarding clarity with the FI, but Rank Order Statistics fail to adequately support a hypothesis that the correlation exists. Explicit comments by PMs are quoted (non-attribution).

KEY WORDS: MANAGEMENT CONCEPTS COMMUNICATIONS HUMAN FACTORS
STATISTICAL ANALYSIS PROJECT MANAGEMENT

ABSTRACT FOR

NTIS White Section
 GRC Ref Section
 ANNOUNCED
 JUSTIFICATION.....

DISTRIBUTION/AVAILABILITY CODES

Dist. ATAIL and/or SPECIAL

A

Student, Rank Service

ELLSWORTH D. BASHORE
GS-15 DNC

Class

PMC CLASS 73-2

Date

21 NOVEMBER 1973

⑥ CLARITY INDICES OF SELECTED DIRECTIVES
ISSUED WITHIN THE DOD AFFECTING
PROJECT MANAGERS,

⑨ Student
Project rept.,

An Executive Summary
of a
Study Report
by

⑩ Ellsworth D./Bashore
GS-15 DNC

⑪ 21 November 1973

⑫ 36 p.

Defense Systems Management School
Program Management Course
Class 73-2
Fort Belvoir, Virginia 22060

408 462

mt

EXECUTIVE SUMMARY

Nineteen Instructions, Directives, Military Standards, Regulations, etc., in the functional areas of Project Management, Systems Engineering, Integrated Logistics Support, System Safety, Human Factors/Engineering, Cost/Schedule Control, and Reliability/Maintainability are analyzed for clarity using the Gunning Fog Index. Relative clarity ranking is compared to relative ranking by about 13 Program Managers (survey results).

Rank order statistics show the survey results and Gunning Fog Index to correlate with about a 0.30 probability that observed results came from an uncorrelated universe (the author accepts the null hypothesis). However, sufficient correlation to merit further investigation is concluded. Specific comments on the subject from several unidentified Program Managers are presented.

CLARITY INDICES OF SELECTED DIRECTIVES
ISSUED WITHIN THE DOD AFFECTING
PROJECT MANAGERS

STUDY REPORT

Presented to the Faculty
of the
Defense Systems Management School
in Partial Fulfillment of the
Program Management Course
Class 73-2

by

Ellsworth D. Bashore
GS-15 DNC

November 1973

ACKNOWLEDGEMENTS

In keeping with the DSMS non-attribution policy, those Project Managers who responded to the questionnaire will not be identified. However, I very much appreciate each of their candid responses. Major Lee Jackson, USAF, of the DSMS staff, was quite helpful on the questionnaire design and with the Project Manager address list. Major Dave Dianich, USAF, and Major George Giacoppe, USA (both faculty staff), and Mr. Bill Hurt (student) were very helpful in pointing me to the Rank Order Statistics for data analysis. Mrs. Sandra Harris, through fast, neat, and accurate typing of letters, questionnaire, and manuscript, was especially helpful.

To each, a hearty thank-you.

Contents

Executive Summary	ii
Acknowledgements	iv
Introduction	1
The Problem	2
Clarity Measure	3
Questionnaire	4
Selection of Directives & Calculation of Fog Index	5
Results and Analysis	8
Conclusion	10
Annotated Bibliography	11
Appendix I	A-I.1
Appendix II	A-II.1
Appendix III	A-III.1
Appendix IV	A-IV.1

CLARITY INDICES OF SELECTED DIRECTIVES*
ISSUED WITHIN THE DOD AFFECTING
PROJECT MANAGERS

SECTION I.

INTRODUCTION

The first several classes (particularly IDSAM and SL/P) in the DSMS PMC 73-2 revealed to me that use of requirements in directives (directives, instructions, regulations, standards, etc.) varied widely among the Services. These variances appeared to come from diverse interpretations due to lack of clarity of the directives. Class discussions pointed out that for one Service, a particular area may be dogma, while for another Service, it was something to be overcome, ignored, or otherwise treated so as not to slow progress. This led me to wonder if I could measure the clarity of the directives and correlate the clarity indices with opinions of Project Managers.

I found a well-organized index of clarity (the Gunning Fog Index (reference 1, p. 38)). I then selected the areas of Project Management, Systems Engineering, Integrated Logistics Support (ILS), System Safety, Human Factors, Cost/Schedule Control Systems Criteria (C/SCSC), and Reliability/Maintainability (R/M) to study, and developed a questionnaire to gather opinions of Project Managers (Appendix I). Results are reported herein.

*ABSTAINER

This study represents the views, conclusions and recommendations of the author and does not necessarily reflect the official opinion of the Defense Systems Management School nor the Department of Defense.

SECTION II.

THE PROBLEM

Writing is of great importance to all areas of work done by humans. In the Department of Defense (DOD), writing is the main communication between each level, from the highest down to the lowest. This is also true at every level between DOD elements and the Congress, the news media, the public, the contractor, etc.

If one accepts the importance of writing, then one should readily accept that clear writing (i.e., "not obscure; free from confusion or ambiguity; easily understood") (Reference 3) is of equal importance. Consider a writing such as the Standard Marine Insurance Clauses. Over several hundreds of years from the days of Lloyd's Coffee House, those words and phrases have been interpreted and their meanings recorded. No one would dare change the phrases today because new words would become cause for new court cases to clearly define them.

In our world today, we do not have time to spend interpreting unclear writing. We need initial clarity.

In the INTRODUCTION, I opined that lack of clarity was likely a cause of various interpretations of directives within the DOD. That led me to seek a measure of clarity upon which to study the problem.

SECTION III.

CLARITY MEASURE

The search for a clarity measure ended with Robert Gunning's "Fog Index" (reference 1, pp. 31-45). Since about 1944, Robert Gunning Associates has worked in readability counseling (clear writing). His works have been used in many corporations and government agencies. The Army, Navy, General Services Administration, and Department of Agriculture are granted use of his copyright material.

Gunning studied previous readability measures and found them to lack logic and to be too complicated. Thus, he developed his own, which is (reference 1, p. 38):

$$\text{Fog Index (FI)} = 0.4 (\text{no. words/sentence} \\ + \text{no. words of more than} \\ 2 \text{ syllables/100 words})$$

Words such as "manpower" (combined, short, easy), "created" (verb form made three syllables by adding -ed or -es), and proper nouns are excluded from the "more-than-two-syllable" count.

He found that the Fog Index related to normal reading ability and publications like this (reference 1, p. 40):

	Fog Index	Reading Level By Grade	By Magazine
	17	College graduate	
	16	College senior	(No popular
	15	College junior	magazine
	14	College sophomore	this difficult.)
Danger Line	13	College freshman	
	12	High-school senior	<u>Atlantic Monthly</u>
			and <u>Harper's</u>
	11	High-school junior	<u>Time</u> and <u>Newsweek</u>
	10	High-school sophomore	<u>Reader's Digest</u>
Easy-	9	High-school freshman	<u>Saturday Evening Post</u>
reading	8	Eighth grade	<u>Ladies' Home Journal</u>
Range	7	Seventh grade	<u>True Confessions</u> and
			<u>Modern Romances</u>
	6	Sixth grade	<u>Comics</u>

SECTION IV.

QUESTIONNAIRE

To attempt correlation of Fog Index with opinions of users, Project Managers were polled for their opinions by the questionnaire (Appendix I). Of 27 polled, 15 responded. Two of those chose not to complete the questionnaire (this is further discussed later), and several chose not to respond in certain areas.

The polling process was somewhat hampered by the DSMS Project Manager address list's being outdated. Several Navy Project Managers on the initial list given to me were no longer in existence. Also, several of the Navy PMS offices on the master list were noted to be those concerned with specific system improvements (such as the 1200 psi Steam System Improvement Office, PMS 301), rather than "Weapons System Acquisition Managers". I feel that such offices should be better identified to future PMC students so that they can better judge to whom questionnaires should be sent. Also, the list should be kept current.

Two responses which did not include the returned questionnaire are worthy of note. One of these was from an aircraft PMO for a Prototype Study. That office has a Project Master Plan (PMP) which waives normal requirements in the FUNCTIONAL areas. The other response is Appendix III (masked for non-attribution).

Other comments from the Project Managers polled are listed in Appendix IV. These are all comments explaining the rank orders chosen. Originators of the comments have been deleted for non-attribution.

SECTION V.

SELECTION OF DIRECTIVES AND
CALCULATION OF FOG INDEX

Appendix II is the list of directives analyzed. I chose samples from paragraphs which describe intents and actions, rather than defining terms. I counted jargon and common abbreviated forms to lessen the Fog Index. As an example, consider the following from DODD 5000.3, paragraph IV.c:

"OT&E is that test and evaluation conducted to estimate the prospective system's military utility, operational effectiveness, and operational suitability (including compatibility, interoperability, reliability, maintainability, and logistic and training requirements), and need for any modifications. In addition, OT&E provides information on organization, personnel requirements, doctrine, and tactics. Also, it may provide data to support or verify material in operating instructions, publications, and handbooks. OT&E will be accomplished by operational and support personnel of the type and qualifications of those expected to use and maintain the system when deployed, and will be conducted in as realistic an operational environment as possible."

There are 99 words, 4 sentences, and 34 three-or-more-syllable words. ("OT&E" is one word.) This yields a Fog Index of 23.6.

Fog Indices of several directives were averaged for the overall index for each Functional area.

FUNCTION

CLASSIFICATION CATEGORY	FUNCTION							Reliability/ Maintainability
	Project ¹ Management	Systems ² Engineering	Integrated ³ Logistics Support	System ⁴ Safety	Human ⁵ Factors	Cost/ ⁵ Schedule Control		
Very Clear ¹	1	0	1	2	2	3		2
Fairly Clear ²	10	9	7	7	8	9		9
Not Very Clear ³	1	4	2	2	0	1		1
Not Clear ⁴	1	0	2	1	1	0		1
<hr/>								
Fog Index (Avg)	20.0	19.7	26.7	21.9	19.8	20.4		22.9
<hr/>								
Note (ref)			1	1	1			1
<hr/>								

Note: 1. One or more PMs chose not to rate this function.

NUMBERS OF RESPONSES BY CLASSIFICATION CATEGORY FOR FUNCTIONAL DIRECTIVES

TABLE 1

TABLE 2

SURVEY RESPONSE, FOG INDEX, AND RANK ORDERS, AND RANK ORDER FUNCTIONS

<u>SURVEY RESPONSE FREQUENCY</u>							
<u>FUNCTIONAL AREA</u>							
<u>SURVEY RANK</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Very Clear ⁻¹	1	0	1	2	2	3	2
Fairly Clear ⁻²	10	9	7	7	8	9	9
Not Very Clear ⁻³	1	4	2	2	0	1	1
Not Clear ⁻⁴	1	0	2	1	1	0	1
Mean Rank	2.1	2.3	2.4	2.2	2.0	1.8	2.1
FI (Avg)	20.0	19.7	26.7	21.9	19.8	20.4	22.9
FI Rank	3	1	7	5	2	4	6
Relative Survey Rank	3.5*	6	7	5	2	1	3.5*

<u>RELATIVE SURVEY RANK</u>	<u>FI RANK</u>	<u>d</u>	<u>d²</u>
1	4	-3	9
2	2	0	0
3.5*	6	-2.5	6.3
3.5*	3	+0.5	0.2
5	5	0	0
6	1	+5	25
7	7	0	0

40.5

*Two equal Mean Ranks.

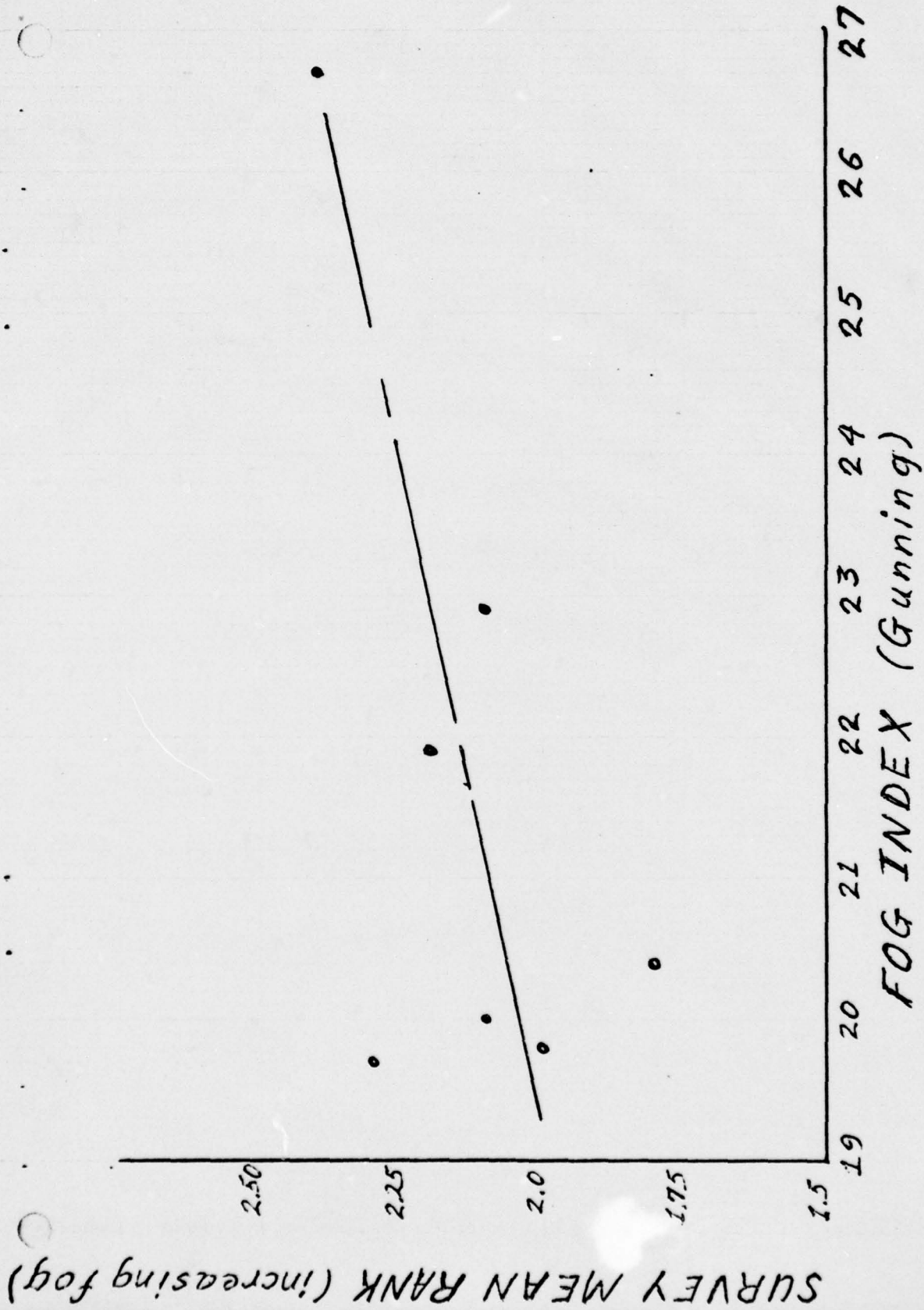


Fig 1
Fog Index versus Survey Mean Rank

SECTION VI.

RESULTS AND ANALYSIS

Table 1 shows the survey results and FI (avg) for each FUNCTION. Table 2 shows Survey Response Frequency, FUNCTIONAL AREA, SURVEY RANK, MEAN RANK (based on a 1-4 scale), FI (avg), FI RANK, RELATIVE SURVEY RANK, Rank Order Comparisons, and Rank Order Difference Functions.

On Figure 1, Survey Mean Rank is plotted as a function of calculated Fog Index. The plotted graph suggests some correlation of Survey Rank "Fog" as a linear function of correlated Fog Index. To test for correlation, the Spearman Rank Correlation Coefficient and method of Stockton (reference 2, pp. 597-599: Appedix I) is used as follows:

$$Rr = 1 - \frac{6 d^2}{n^3 - n}$$

Rr = Spearman Rank Correlation Coefficient.

n = Sample size = 7 (Tables 1 and 2)

d^2 = Summation of Squared Rank Order Differences (Table 2)

$$Rr = \frac{1 - 6(40.5)}{(7)^3 - 7}$$

$$Rr = \underline{0.250}$$

t (distributed with n-2 degrees of freedom) =

$$Rr \left(\frac{n-2}{1 - (Rr)^2} \right)^{\frac{1}{2}}$$

$$t = \underline{1.36}$$

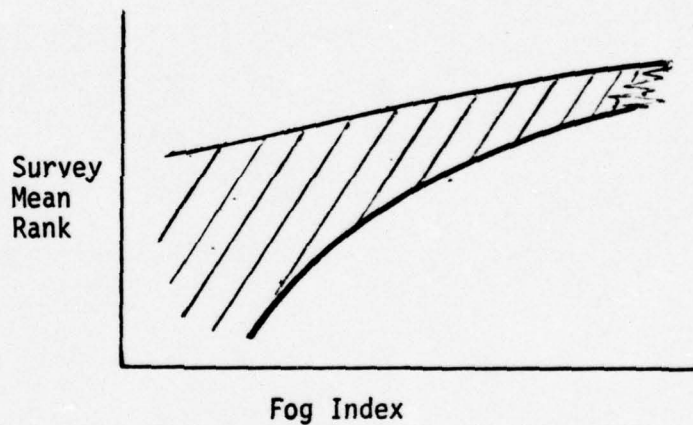
Entering Appendix I, pp. 56 (DISTRIBUTION OF t for Degrees of Freedom as a function of Probability (P) that R_r (observed) would occur in random sampling from a universe in which there is no correlation), $t = 1.36$ lies between $P = 0.20$ and $P = 0.30$.

This suggests as much as a 0.30 probability that the results of sampling came from a universe in which there is no correlation.

SECTION VII.

CONCLUSION

Analysis fails to support a conclusion that the null hypothesis (i.e., There is no correlation between Gunning Fog Index and Project Managers' ranking of "fog" applied to FUNCTIONAL AREA DIRECTIVES) can be rejected. However, there is enough correlation to suggest further analysis of additional data which could increase the correlation. Figure 1 suggests some probability that the relationship may look like this (vice linear):



In view of the generally high Fog Indices found, I conclude that much could and should be done to clarify DIRECTIVES. The Project Managers' comments shown in Appendices III and IV are further strong evidence that many directives need to be clarified. Gunning's techniques (reference 1) would be of much help in such a job.

ANNOTATED BIBLIOGRAPHY

1. Gunning, Robert. The Technique of Clear Writing. New York: McGraw-Hill, 1971: Library of Congress Catalog Card No.: 68-9047/07-025206-8.

A book stressing easy-to-learn methods which enable a person to express himself clearly and accurately. It describes the "Fog Index" and grants use of copyrighted materials to the Army, Navy, GSA, and Dept of Agriculture.

2. Stockton, John R. Introduction to Business and Economic Statistics, third edition, South-Western Publishing Company.

An introductory course in statistics for businessmen and economists.

3. Webster. New World Dictionary of the American Language, College Edition, 1957.

APPENDIX I

DSMS-PMC

SUBJECT: Program Management Course--Student Questionnaire

1. The Defense Systems Management School requires each student in the Program Management Course to complete a study project. I have elected to examine the clarity of directives, instructions, and regulations directing Project/Program Managers in the functions of Project Management, Systems Engineering, Integrated Logistics Support, System Safety, Human Factors, Cost/Schedule Control, and Reliability/Maintainability. I will attempt to determine, through recognized indices, the clarity of those documents.

2. To attempt to correlate results of clarity indices determinations with opinions of persons to whom the documents are addressed, I have prepared the inclosed questionnaire. I ask that you (your respective office staff for the area concerned) complete the questionnaire and return it in the inclosed self-addressed envelope. Results will not be attributed to particular (Project Office) sources, but may be presented in terms of Services (Army, Navy, Air Force) or commodities (missile system, aircraft system, ship system, electronics system, etc.). Narrative comments are welcome and additional pages may be attached. In particular, please cite any specific documents (by directive number, regulation number, title, date, etc.) which you consider very clearly written and any you consider very poorly written (unclear). No signature is required. Your cooperation and candid response will be greatly appreciated.

3. Please return the questionnaire by 30 October 1973.

2 Incl
as

E. D. BASHORE
Student
Program Management Course 73-2

PROJECT/PROGRAM OFFICE: _____

1.

DATE: _____

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

PROJECT/PROGRAM MANAGEMENT

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

SYSTEMS ENGINEERING

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	A-I.3

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

INTEGRATED LOGISTICS SUPPORT

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	A-I.4

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

SYSTEM SAFETY

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	A-I.5

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

HUMAN FACTORS

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

COST/SCHEDULE CONTROL

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	A-I.7

DSMS PMC 73-2 QUESTIONNAIRE

INSTRUCTIONS, DIRECTIVES, REGULATIONS ON FUNCTIONS

PLEASE CIRCLE NUMBER OF DESCRIPTION BELOW WHICH, IN YOUR OPINION, BEST DESCRIBES INSTRUCTIONS, DIRECTIVES, REGULATIONS ON THE FUNCTION OF:

RELIABILITY/MAINTAINABILITY

<u>DESCRIPTION</u>	<u>COMMENT</u>
1. Very clear; no questionable area regarding requirements and their applications to the Project/Program; they are implemented readily; they are perfectly realistic.	
2. Fairly clear; requirements and their applications to the Project/Program are somewhat questionable; they are implemented without much need for interpretation; they are fairly realistic.	
3. Not very clear; requirements and their applications to the Project/Program are quite questionable; they need considerable interpretation for implementation; they are not very realistic.	
4. Not clear; requirements and their applications to the Project/Program cannot be understood; implementation requires considerable interpretation and difficulty; they are unrealistic.	A-I.8

APPENDIX II

List of Directives in Functional Areas Analyzed for Fog Index:

Project Management Directives:

DODD 5000.3
DODD 5000.19
BUPERSINST 1040.12 (Navy)
AFR 800-2 (Air Force)
AR 70-17 (Army)

Systems Engineering:

AFR 800-3 (Air Force)
MIL-STD 499A

Integrated Logistics Support:

NAVMATINST 4000.20A (Navy)
DODD 4100.35
MIL-STD 480

System Safety:

MIL-STD 882
SECNAVINST 5100.10A

Human Factors/Engineering:

MIL-STD 1472

Cost/Schedule Control:

NAVMATINST 7000.17A
MIL-STD 881
AFSCR 800-1 (Air Force)

Reliability/Maintainability:

TM 38-703/3 (Army)
SECNAVINST 3900.36A (Navy)
MIL-STD 499A

APPENDIX III

SUBJECT: Program Management Course; Student Questionnaire

Mr. E. D. Bashore
Student
Program Management Course 73-2

1. About three years ago my office made an investigation of various Management Information Systems in order to determine what might be the best system for use by this office. During the course of the investigation it was found that there are literally hundreds of instructions, directives, regulations, etc., which govern the activities of a Project Manager or with which he may be required to comply. It is my opinion that the amount of clarity, realism or value, of instructions in any of the seven functional areas listed in your questionnaire, varies from the ridiculous to the sublime. This does not mean that some instructions are good and some are bad but that within almost every instruction there is some good and some bad.
2. The quantity of instructions plus the fact that each succeeding lower level of authority invariably feels the need to produce an implementing or interpretive instruction relative to each directive issued by the immediately senior authority, is prima facie evidence that the need for interpretation is at least assumed. After six years in the requirement/acquisition business I describe my duties as a Project Manager as a "Compromise Decision Maker". By this I mean that a Project Manager can simply not comply with all requirements, therefore he does what he determines to be best for the project in question. As a result, while the requirements of an individual instruction may be realistic, at least to the originator, the sum total of all requirements of all instructions is not realistic.
3. I have placed your questionnaire, as well meaning as it is, in the list of requirements that this office at present cannot comply with. Although I recognize the value of what you're trying to do, even if you're successful I doubt that any results would be felt by this office for years to come. In the meantime I will continue to direct the efforts of myself and my staff to tasks of more immediate benefit. Therefore the general comments listed above vice the specific answers requested by your questionnaire will have to suffice.

A-III.1

APPENDIX IV

PM Comments on Directives

1. PROJECT/PROGRAM MANAGEMENT:

<u>COMMENT</u>	<u>SOURCE</u>
a. "DOD-level directives and instructions are fairly clear. However, implementing regulations, such as the AR 11-16 series, are subject to considerable interpretation. AMC instructions concerning FROMIS reporting and RECAP procedures are very difficult to apply at the project level."	Army
b. "Project/Program Management directives, as initiated at the DOD-level, are, in general, very clear. As implementing directives are issued, increasing constraint and cloudiness creeps in. However, they are fairly realistic and cause no serious constraint in the ability of the Project Manager to carry out his responsibilities."	Navy
c. "For one FY 77 program, this project officer has tasked an outside activity to identify all required directives which require compliance from inception of the program in FYDP to a procurement award. The count of directives/instructions approaches 100. Too many rice bowls involved."	Navy
d. "AFSC/AFLCR 800-5, dated 14 May 1971: Document is clear related to acquisition management and implementation. Information is easily implemented and interpreted related to AGE management."	Air Force

2. SYSTEMS ENGINEERING:

- a. "AMCR 70-52, draft, dated 10 Sep 73; TM 38 - 760-1: Both documents are very broad in scope and they provide only general guidance for system engineering planning and leave most of the burden for development of a successful SEMP to the individual program office." Army

SYSTEMS ENGINEERING (CONT'D)

- | <u>COMMENT</u> | <u>SOURCE</u> |
|--|---------------|
| b. "The Total Systems Responsibility of the contractor on the ---- program made the newly-created 375 series management/engineering directives difficult to understand, interpret, and initiate. This contractual procedure essentially left the interpretation of the military standards and specifications in the hands of the contractor with only the monitoring capability remaining with the Air Force." | Air Force |
| c. "This project has felt neither constraint nor control due to any Systems Engineering Instruction to date. As instructions are proposed, they are reviewed and are acceptable only if the instruction recognizes the responsibilities and authority of the Project Manager established by the 5000 series of instructions." | Navy |
| d. "Systems engineering has as many definitions as there are design activities in the ship Navy. This presents a problem, whenever a specific interface exists between the ship and installed systems or equipment requiring the combined and concurring efforts of several activities to establish realistic requirements." | Navy |

3. INTEGRATED LOGISTICS SUPPORT (ILS)

- | | |
|---|-----------|
| a. "The regulation does not take into account the interface between the separate Services' internal operations and procedures. Solutions are entirely academic and not the real world." | Air Force |
| b. "DOD Directive 5000.1, Acquisition of Major Defense Systems, clearly states which systems are to be project/program managed. Although this directive is general in nature, there is no question that logistic support will be a principal design parameter. Implementation procedures are not, of course, contained in this directive. Other instructions such as TM 38-710, Integrated Logistic Support Implementation Guide for DOD Systems and Equipments, and TM 38-703 series (ILS) technical manuals are fairly well written and go into considerable detail." | Army |

INTEGRATED LOGISTICS SUPPORT (CONT'D)

COMMENT

SOURCE

- TM 38-703 manuals are in need of revision; however, as in the case with all ILS instructions, the project/program manager must tailor the procedures and management tools to his particular weapon system and organization. No guide or instructions can be followed without exception for all weapon systems."
- c. "AFSC/AFLCR 400-10, dated 16 April 1969, as amended by Change 1, dated 18 June 1970: Document is concise and clearly written for implementation. Furthermore, it provides a guide to the specific responsibilities of the integrated logistics support activity of a SPO."
- d. "These directives are fairly broad and constitute the baseline of requirements, which each Project Manager/Acquisition Manager tailors to the needs of the system, its complexity, and the CNO Plan for Use. Some ILS elements are readily acquired; others impacting on OPN, O&MN and MCON funding areas are much more difficult to identify and acquire. Directives are never 'perfectly realistic' even though their objectives may be. One key problem in ILS is the present lack of MIL-STD or MILSPEC to invoke in contracts, which is biddable by System/Hardware Contractors."
- e. "There is no realistic relationship between AFR 800-8 and the Air Force's fiscal policy. AFRs define the PM as responsible for integrating logistics and reducing LCC, but provide no real mechanism for financing his actions for implementation."

Army (Cont'd)

Air Force

Navy

Air Force

4. SYSTEM SAFETY

- a. "Present revision is not up-to-date and is difficult to apply. MIL STD 882 is currently being revised."
- b. "MIL-STD-882, System Safety Program for Systems and Associated Subsystems and Equipment, dated 15 July 1969, is a complete guide to program requirements. AMCR 385-100, Safety Manual, dated April 1970, with changes, is in detail and prescribes safe methods

Army

Army

SYSTEM SAFETY (CONT'D)

- | <u>COMMENT</u> | <u>SOURCE</u> |
|---|---------------|
| and practices. AMCR 385-12, Life Cycle Veritication of Materiel Safety, dated 29 June 1972, covers re-quired safety reviews during development, testing, production on through life cycle until disposal. AR 385-16, Safety for Systems, Associated Subsystems and Equipment, dated 22 September 1972. DOD 4145.26.7, DOD Contractor's Safety Manual for Ammunition Explosives and Related Dangerous Material, dated October 1968. A complete manual providing uniform safety practices to be used in industrial plants in regard to ammunition." | Army (Cont'd) |
| c. "Without a good background in System Safety Engineer- ing and Management, it would not be possible to develop and implement a program which would produce the desired results." | Navy |
| d. "Requires qualified SSE to determine the applicable paragraph that should be made part of the contract for a given system. Once this is accomplished, the contractor then can comply and the Program Officer can make reasonable reviews of his efforts." | Air Force |
| e. "MIL-STD-882 requires additional definition of hazard levels for meaningful contractual imple- mentation." | Air Force |

5. HUMAN FACTORS

- | | |
|--|-----------|
| a. "Life support requirements are relatively clear and detailed; requirements related to efficiency and improved performance are not so well defined and therefore are more difficult to apply." | Air Force |
| b. "The so-called 'man-machine' interface permeates so many other disciplines (ILS, R/M, 3M System) and is so continually addressed at the level of those disciplines that the Human Factors direc- tives are really 'second-tier' impact. The trade- off between human factors and ship design and ar- rangement are often difficult at best, and entering into these trade-offs is the variable of human ingenuity, which permits less than perfect design to be the practical approach when weighed against \$ cost." | Navy |

HUMAN FACTORS (CONT'D)

COMMENT

SOURCE

- c. "Concur with ADM Rickover's statement, "Human factors, as related to a ship construction program, makes about as much sense as teaching your mother-in-law to suck raw eggs." We should concentrate on arrangements to provide access for maintenance and general habitability improvement."

Navy

6. COST/SCHEDULE CONTROL

- a. "The problem in this area is the few people at HQs management and working levels who understand and appreciate the requirements. As a result, there is opposition in the transition to a system that provides greater visibility and control of costs and schedules. Also, we may be asking for more data than we need to effectively monitor and manage a ship program. This is proven out by the reluctance of private shipyards to bid on RFPs invoking 7000.2. Further, 7000.2 does not provide a capability to predict cost and schedule problems."

Navy

- b. "Although the clarity of requirements represents no real problem in the C/SC area, implementation represents a significant challenge, the reason being that the successful application of C/SC criteria demands visibility and government approval of contractor internal control and reporting systems; therefore it represents a quite sensitive issue in government/contractor relations. Further, a basic goal of C/SC is increased visibility of contractor performance, eliciting a natural reluctance on the part of the contractor to participate."

Navy

- c. "As pertains the standardization and management mission of the ---- project, the uniqueness of a project of this type contributes to time-consuming interpretation of instructions received which are generally weapon-system-oriented. The need exists in this area as well as other management elements to have regulations or directives addressing management functions which are not necessarily weapon-system-oriented."

Army

COST/SCHEDULE CONTROL (CONT'D)

<u>COMMENT</u>	<u>SOURCE</u>
d. "AMCPM 37-5, "Cost/Schedule Control," is well presented and clear. Whether this judgment will hold after we get into the application of C/SCSC (scheduled to start with Full Scale Development contract in December 1973) remains to be seen."	Army
<hr/>	
<p>7. <u>RELIABILITY/MAINTAINABILITY</u></p>	
a. "Primary documents: MIL-STD-470, Maintainability; MIL-STD-785, Reliability; ARY 702-3, Army RAM. Documents are reasonably clear. Problem is with realism; normally, funds are not available in sufficient amounts to accomplish programs specified in documents."	Army
b. "AR 702-3, dated 22 March 1973, is the implementing regulation for Reliability/Maintainability. As can be seen by the date, the regulation was published recently; therefore, it is best described as 'Fairly Clear'. This AR is a great improvement over the superseded AR 705-5, dated 8 January 1968."	Army
c. "Requirements are generally vague and difficult to interpret. If invoked, as written, in a ship contract, the cost of the ship would be increased by an undetermined amount, without practical benefit to the performance of the delivery ship."	Navy
d. "MIL-STD-471 (Maintainability Demonstration)-- Comprehensive, clear, and specific (Rated -2). MIL-STD-785A (Reliability Program for Systems and Equipment Development and Production)-- Comprehensive; if followed to the letter, a good R program should result (Rated -2). MIL-STD-781B (R Tests--Exponential Distribution)--Well written; good guidance. (Rated -2)."	Air Force