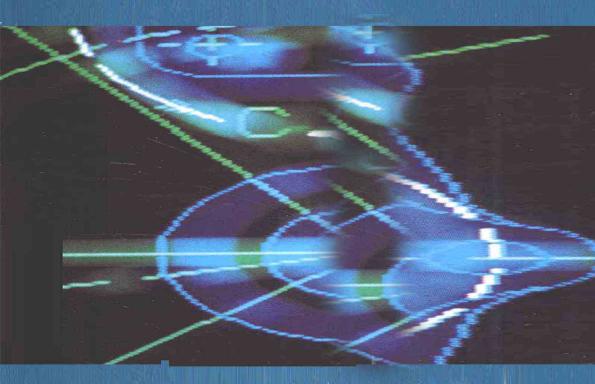
Technical Writing Professional Communication



Leslie A. Olsen and Thomas N. Huckin

Technical Writing and Professional Communication

Leslie A. Olsen
The University of Michigan

Thomas N. Huckin
The University of Utah

This book is printed on acid-free paper.

TECHNICAL WRITING AND PROFESSIONAL COMMUNICATION

Copyright © 1991 by McGraw-Hill, Inc. All rights reserved. Formerly published under the title: Principles of Communication for Science and Technology. Copyright © 1983 by McGraw-Hill, Inc. All rights reserved. Portions of this text also appear in Technical Writing and Professional Communication for Nonnative Speakers of English, Second Edition. Copyright © 1991 by McGraw-Hill, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

9 10 11 12 13 14 15 DOC/DOC 0 9 8 7 6 5 4 3 2

ISBN 0-07-047823-6

This book was set in Century Expanded by Monotype Composition Company.

The editors were Judith R. Cornwell and James R. Belser;

the designer was Wanda Siedlecka;

the production supervisor was Salvador Gonzales.

New drawings were done by Fine Line Illustrations, Inc.

R. R. Donnelley & Sons Company was printer and binder.

The cover illustration is a 3-dimensional graphic of a petro-chemical piping analysis generated by a customized design/engineering software program.

Photo: Stephen Wilkes/The Image Bank.

Library of Congress Cataloging-in-Publication Data

Olsen, Leslie A.

Technical writing and professional communication / Leslie A. Olsen, Thomas N. Huckin. — 2nd ed.

p. cm

Rev. ed. of: Principles of communication for science and technology. c1983.

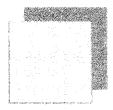
Includes bibliographical references.

ISBN 0-07-047823-6

1. Technical writing. I. Huckin, Thomas N. II. Olsen, Leslie A. Principles of communication for science and technology. III. Title.

T11.054 1991 808'.066—dc20

89-13465



About the Authors

Leslie A. Olsen is the Director of the Technical Communication Program at the University of Michigan's College of Engineering. She teaches courses on theory and practice of rhetoric and composition, technical and professional writing and speaking for both native and nonnative speakers of English, and discourse analysis. She conducts research on coherence and cohesion, readability, computer-assisted writing analysis, documentation, and the structure of scientific, technical, and legal language.

Dr. Olsen has B.A.s in Chemistry and English and an M.A. and Ph.D. in English, all from the University of Southern California. She has taught at the University of Michigan since 1972 and served as Visiting Associate Professor at Carnegie Mellon University, technical writer and editor for the U.S. Navy and Benjamin Publishing Company, and supervisor for the development and installation of a sophisticated text processing and publishing environment for the University of Michigan's Computer-Aided Engineering Network (CAEN). She has consulted for a variety of industries and governmental agencies, including IBM, Dow-Corning Corporation, Exxon Education Foundation, Michigan Bell, Bell Northern Research, Moody and Associates Gas Exploration, the National Endowment for the Humanities, the Michigan Supreme Court, the Tennessee Supreme Court, the Michigan Department of Corrections, and the Industrial Technology Institute, a nonprofit corporation developing computer-assisted manufacturing and design.

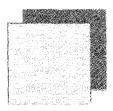
Thomas N. Huckin is an Associate Professor in the University Writing Program and the Department of English at the University of Utah. He coordinates the university's technical writing curriculum and teaches courses in technical and professional writing, discourse analysis, advanced expository

writing, and applied linguistics. Previously he taught at Carnegie Mellon University and at the University of Michigan.

Dr. Huckin's research interests include the rhetoric of scientific writing, second-language vocabulary acquisition, the linguistic analysis of stylistic prescriptions, and the cognitive processing of argumentative texts. He is an Affiliated Researcher at the Center for the Study of Writing at Carnegie Mellon University.

Professor Huckin has been a Senior Fulbright Lecturer at the Catholic University in São Paulo, Brazil, and has taught technical communication courses at the Eindhoven University of Technology, Eindhoven, the Netherlands, and at the General Motors Technical Institute in Michigan. He has also served as a consultant to private corporations and government agencies.

Dr. Huckin holds an A.B. degree in English from Princeton, a Diploma in French Civilization from the University of Paris (Sorbonne), and a M.A. in Comparative Literature and a Ph.D. in Linguistics from the University of Washington. When not working, he can often be found climbing or skiing in the Wasatch Mountains of northern Utah.



Preface

Both technical writing and professional communication will have an effect on students' future producing and consuming careers. Whether they will assemble children's backyard playground equipment or build a bridge, whether as tax-payers they will present a proposal for refuse pickup for a community board's consideration, or as committee chairs present the design department's recommendation for computerized inventory control forms to upper management, concise technical messages and clear professional communication are needed to ensure that information is effectively received and/or sent. This text is designed to help students achieve success in the realization of these goals.

Technical Writing and Professional Communication, second edition, is the revision of Principles of Communication for Science and Technology and is designed for intermediate and advanced students in both basic and applied sciences and business and other technically oriented professions. It focuses on those aspects of scientific and professional communication that are known to be troublesome for both university students and industry employees. It emphasizes principles and use rather than usage—it offers functional explanations rather than formal rules.

OUR APPROACH

We have maintained the functional/rhetorical focus of the first edition, and believe it is the text's most important feature. That is, *Technical Writing and Professional Communication* emphasizes the communicative use of language rather than simply its formal aspects. Although we have treated the formal aspects of language where appropriate (in discussing report formats, grammar,

punctuation, and visual elements), we have placed more emphasis on the psychological, social, and rhetorical principles underlying effective communication. In doing so, we have focused on language in meaningful contexts, not on sentences or words in isolation.

A second important feature of the book—and one which stems from its rhetorical approach—is its treatment of the early stages of writing. How does a writer think up something to say, find and define a topic, find appropriate things to say about a topic? In our experience, even if students or professional engineers have been assigned to do particular studies and to write reports about them (and thus have found topics), they often do not know how to set up and state a report's problem effectively for a given audience or how to define and apply criteria needed to solve the problem. These skills are critical for scientific and technical professionals, and Chapters 2, 3, 4, and 6 of the book deal explicitly with them in an approach strongly indebted to classical argument and to Richard E. Young, Alton Becker, and Kenneth L. Pike's Rhetoric: Discovery of Change.

As the third important feature of the book, we believe we have provided complete and explicit explanations of the main points. We believe that science, engineering, and other professional students prefer systematic, step-by-step instruction and that they like to have reasoned explanations for how things "work." It follows that this approach to how language functions in communication is the most effective for these students.

This point gives rise to yet another feature of the text, namely, its more overt emphasis on the *process* of producing an effective piece of communication for a given audience. Too often, we think, textbooks treat writing as a finished product. Models of good writing for the student to imitate are presented, but adequate guidance by which the student can learn to cope with novel situations on his or her own is not given. We have provided step-by-step procedures that students may follow as guides to the writing process, including a number of flow charts and newly added sections on prewriting, word processing, revising and testing, and footnoting and referencing. At the same time, we continue to emphasize the fact that technical communication is a *social* process in which *text conventions* play a major role.

NEW TO THIS EDITION

In addition to the sections mentioned previously, we have added other new and/or expanded features to reflect the rapidly changing environment in which technical communication occurs,

• Integrated throughout the text is a concern with international dimensions of modern communication that reflects the important fact that science, technology, and business are increasingly becoming global activities.

- Treatment of the ethical dimensions of communication is prompted by the rising interest in ethical concerns as reflected by the many scandals that have plagued government and corporate officials in recent history.
- A concern with multiple authorship and group activities reflects the increased prominence of writing and publication teams in organizational and private settings.
- Many case study exercises provide simulated group activities and organizational settings for students accustomed to working alone in academic environments.
- The treatment of computer-based writing in Chapter 5 provides guidance on how to use the dramatically increased availability of computer resources most effectively.
- The expanded coverage of genres in Part IV satisfies the need for treatment of instructions, procedures, and computer documentation; of oral communications such as those that occur in meetings and negotiations; and of theses and dissertations.

Finally, we hope that *Technical Writing and Professional Communication* will serve not only as a course text, but also as a long-term reference work. As such, it should be especially useful to both university-level students in technical areas who are including English in their studies and who plan to continue into technical careers, and to practicing scientists and engineers who need a self-instructional reference book in written and oral English for technical communication.

- This edition contains a partial answer key provided as an aid to learning for both these groups of learners as well as for their instructors.
- To further increase the book's usefulness, we have included many exercises, lists of supplementary readings, a reference appendix on punctuation, sample reports and letters, and indexes.
- Additionally, an Instructor's Manual is available which contains additional
 exercise material, suggestions for setting up the curriculum and course
 syllabus, advice on how to use different chapters, topics for class discussion,
 and other aids for instructors.

NOTE TO INSTRUCTORS

While English is the primary language of business, technical, and scientific subjects, it may not be the native language of many students of these disciplines. Therefore, a companion text to the one in your hand, titled Technical Writing and Professional Communication for Nonnative Speakers

of English, second edition, is also available. The first twenty-eight chapters of both texts are identical so that both books can be used in the same classroom to cover basic principles of technical communication. The remaining ten chapters and appendixes in the version for nonnative English speakers include coverage of special problems that nonnative speakers are known to have when using English: countability and the indefinite article, the definite article, verbs, modal verbs, relative clauses, connectives, noun compounds, vocabulary building, informal conversational expressions, and pronunciation.



Acknowledgments

The preparation of this book has been a long but exciting project and one which would not have been possible without the help and encouragement of our families, friends, and colleagues, many professional acquaintances, and many students. We would like to thank all those who have contributed in one way or another to the completion of this book, but in particular we would like to thank the following people for their special contributions: Christiane Huckin for her patience and support as well as for other invaluable behind-the-scenes assistance; our parents, grandparents, and siblings for their unflagging moral support; and our teachers and later colleagues—Heles Contreras, J. C. Mathes, Dwight W. Stevenson, Louis Trimble, Virginia J. Tufte, W. Ross Winterowd, Richard E. Young—for our early training in the field and their later influence and inspiration.

In addition, we would like to thank many others who have provided special research materials, intellectual stimulation, and other forms of assistance: Richard C. Anderson, Charles Bazerman, Robert Caddell, Edward P. J. Corbett, Barbara Couture, Mary Dieli, Richard Easton, Richard Enos, Hansford W. Farris, Linda Flower, Mary Sue Garay, Jone Rymer Goldstein, M. A. K. Halliday, Blanchard Hiatt, Margaret Kantz, David Kieras, Walter Kintsch, Moira McFadden, Carolyn Miller, Chaim Perelman, Marcia Petty, Gerri Power, Larry Selinker, Jack Selzer, Henrietta Nickels Shirk, David Steinberg, Alfred Sussman, John M. Swales, Julie Wei, and the many other authors we have cited in the references and other readings (a list of these authors appears at the end of the book). We would like to thank those who have provided special research funds: The University of Michigan—particularly, the College of Engineering, the Horace H. Rackham School of Graduate Studies, the Center for Research on Learning and Teaching, and the Division

of Research Development and Administration—and the National Endowment for the Humanities; our colleagues Thomas M. Sawyer, Lisa Barton, Peter Klaver, and James Zappen for their ready counsel and support; and our office staff, Linda Bardeleben and Connie Christman for cheerfully putting up with us even in times of stress.

We would also like to thank our reviewers, Patricia Sullivan, Karl Drobnic, Quentin Johnson, Louis Holschuh, John Lackstrom, Carol Romett, Christopher Gould, William Woods, Douglas Wixson, Ruth Falor, O. Allen Gianniny, Thomas E. Gaston, Douglas L. Ewing, Jay Webster, Carolyn R. Miller, Deborah B. Norman, Dean Huber, Shelia K. Webster-Jain, Robert Kribbs, Terence Odlin, James M. Cunningham, Margaret Kantz, Michael G. Moran, C. William Brewer, and Jack Selzer for conscientiously and expertly examining various drafts of our manuscript and giving us numerous helpful suggestions. We wish to thank Phillip Butcher, Judy Cornwell, James Belser, and Claudia Tantillo of the McGraw-Hill staff for their help in producing the book.

Finally, we would like to acknowledge the contribution of many students in our classes at the University of Michigan and Carnegie Mellon University. They have been patient and helpful experimental subjects and sources of examples, suggestions, and new ideas.

LESLIE A. OLSEN THOMAS N. HUCKIN



Contents

Preface xvii Acknowledgments xxi

PART ONE INTRODUCTION 1

1	Why Study Techni	ical	and	Professiona	l
	Communication?	3			

- 1.1 The Importance of Good Communication Skills 4
 - The Social and Ethical Aspects 6
 - Legal Considerations 7
 - 1.2 The Frequency of Technical and Professional Communication 7
 - 1.3 The Collaborative Nature of Technical and Professional Communication 8
 - 1.4 The Computerization of Technical and Professional Communication 9
 - 1.5 The International Nature of Technical Communication 10
 - 1.6 The Specific Skills Needed 11
 - 1.7 The Complexity of Technical and Professional Communication 13
 - What Is a "Problem"? 14
 - Types of Problems 16
 - Intellectual Skills in Problem Solving and Communication 17
 - Project Management Skills 18
 - Conclusion 18

References 20 Additional Reading 21

PART TWO

GENERAL	STRATEGIES	FOR	THE	WRITING
PROCESS	23			

- 2 Generating Ideas 25
 - 2.1Defining the Problem and Your Task 26
 - 2.2 Brainstorming 27
 - 2.3 Using Systematic Questions as Prompts
 - Exploring Field and Genre Impacts Using Special Topics
 - Exploring the Subject Using Aristotle's Common Topics
 - 2.4 Using Social and Ethical Considerations to Explore Audience Impacts 36
 - The Impacts of Cooperative Idea Generation 36
 - The Ethical Impacts of Distortion, Incompleteness, Inaccuracy, and Bias 37
 - The Ethical Impacts of Communication as a Cooperative Activity 38
 - 2.5 Finding Information in Libraries or Data Bases 41
 - 2.6 Forming a Potential Thesis or Point 41
 - Organizing Your Ideas in an Outline 42
 - Organizing Your Ideas in an Idea Diagram 43
 - Summary 45
 - Situation 2-1 The Clinic Case (by Mary Sue Garay) 46
 - Situation 2-2 Pluribus: A Question of Investor Information (by Scott A. Goodhue) 51

References 53

Additional Reading 54

3 **Identifying Audiences and Purposes**

- Audiences 56
 - Characteristics of Real-World Audiences 58
 - A Procedure for Audience Analysis 66
- 3.2 Purposes 69

References 70

Additional Reading 71

4 Constructing Arguments

- 4.1Expectations about Claims and Proof 73
- 4.2 Three Basic Strategies of Argument 76

3
12
12

Problems in Planning When Writing on a Computer

Plan throughout the Writing Process 116

• Plan before Writing 115

• Plan during Organizing and Writing

5

6

6.6

6.7	Computer-	Aided	Editing	116
-----	-----------	-------	---------	-----

- 6.8 Electronic Mail 117
- 6.9 Hypertext and Hypermedia 118
- 6.10 Desktop Publishing 119

References 122

Additional Reading 123

7 Testing and Revising 124

- 7.1 Testing 125
 - Testing of Expository Writing 126
 - Testing of Procedural Writing 128
- 7.2 Revising 129

References 131

Additional Reading 131

Situation 7-1 Sequel to the Clinic Case (by Mary Sue Garay) 132

PART THREE VISUAL ELEMENTS 135

8 Selecting Visual Elements 137

- 8.1 Making a Visual Aid Truly Visual 139
- 8.2 Deciding When to Use a Visual Aid 141
 - The Visual Aid for Describing or Clarifying 142
 - The Visual Aid for Highlighting Important Points 144
 - The Visual Aid for Conventional or Easy Presentation of Data 145
- 8.3 Selecting the Best Type of Visual Aid in a Given Situation 147
 - Conventions of Visual Perception 147
 - Some Types of Visual Aids and Their Uses 151
 - Computer-Based Experimentation with Visual Aids 156

Situation 8-1 Giving Credit Where Credit Is Due (by David Balzotti) 158

References 160

Additional Reading 160

9 Creating Visual Elements 162

- 9.1 Designing the Visual Aid 162
 - Making a Visual Aid Relevant 162

Making	g a	Visual	Ald	Clear	168
--------------------------	-----	--------	-----	-------	-----

- Making a Visual Aid Truthful 168
- 9.2 Integrating the Visual Aid into the Text 172
 - Making a Visual Aid Independent 173
- 9.3 Formatting Conventions That Make Reading Easier 177
- 9.4 Formatting Conventions That Make Writing Clearer 180 Additional Reading 182

PART FOUR SPECIFIC APPLICATIONS 185

10 Résumés and Job Letters 187

- 10.1 What Makes a Good Applicant? 188
- 10.2 Designing the Letter of Application 190
- 10.3 Designing the Résumé 191
- 10.4 Other Examples 196

Situation 10-1 The Ethics of Headhunting (Adapted from William B. Werther, Jr., and Keith Davis) 204

Reference 205

Additional Reading 205

11 The Business Letter 207

- 11.1 Basic Letter Formats 207
- 11.2 Forms of Address 218
- 11.3 Letter of Transmittal 220
- 11.4 Letter of Complaint 223
- 11.5 Response to a Letter of Complaint 223
- 11.6 Letter of Request 225
- 11.7 Response to a Letter of Request 226
- 11.8 Cross-Cultural Differences 230

References 232

Additional Reading 233

12 Basic Features of Reports 234

- 12.1 The Foreword and Summary: Organizing Main Points for Nonspecialist Readers 235
 - The Foreword or Introduction 235

 The Summary 2 	3	Ś	ï													į			•											•						•	_							٠	
-----------------------------------	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	---	--	--	---	--	--	--	--	--	--	--	--	--	--	---	--	--	--	--	--	---	---	--	--	--	--	--	--	---	--

- Framing Summaries for Particular Audiences 241
- 12.2 Structuring Proofs and Technical Discussions: Organizing Details for Specialist or Interested Readers 246

References 248

Additional Reading 248

13 Memos, Short Informal Reports, and Progress Reports 249

- 13.1 The Structure of Memos and Short Reports 249
- 13.2 The Function of Memos and Short Reports 252
- 13.3 The Formatting of Memos and Short Reports 269
 - Formatting the Heading of the Memo and Informal Report 269
 - Formatting the Text of the Short Informal Report and Memo 270

Situation 13-1 Information and Communication System Planning at Pure-Pac: Resolving Who Does What (by Barbara Couture and Jone Rymer Goldstein) 274

14 Feasibility Reports 279 References 293

15 Long Reports 294

- 15.1 The Long Informal Report 294
 - The Introduction to the Discussion 294
 - Conclusions and Recommendations 298
- 15.2 The Formal Report 304

16 Proposals 310

- 16.1 The Organization of a Formal Proposal 312
 - Title Page 312
 - Abstract 314
 - Table of Contents 316
 - Introduction 316
 - Background 316
 - Description of Proposed Activity 317
 - Institutional Resources and Commitments 318
 - List of References 318