SCENARIO

You are an engineer for General Power Equipment, Inc. Your work is mainly in research and development. GPE is a medium-sized company that makes machinery powered by small engines and motors, such as lawn mowers, power generators, and pumps. GPE has recently acquired North Star Snow Throwers, an acquisition that seems likely to fit well with the company's other products.

Helen Bergen, the vice president for research and development, has been given the task of integrating North Star into GPE. She asks you to come to a meeting in her office. When you enter her office, you find Jack Kumagai, of GPE's legal staff already there.

Helen greets you, but she has a worried look on her face. She has some printouts in front of her. "Jack and I have just been going over this information that I got off the Web," she says. "Do you know that snow throwers are an open invitation to litigation? Listen to this:

"'Last year there were over a thousand amputations caused by snow throwers and over 5,000 emergency room visits resulting from their use. These things kill people. People get caught in them or run them in the garage and die from carbon monoxide.'"

"Are North Star snow throwers more dangerous than any other?" you ask.

"Not really," answers Jack. "but the warnings on their machines and the instructions in their manuals are inadequate in my opinion."

"That's where you come in," Helen says to you. "We want to avoid litigation, sure, but what we really want is for people to use any of our products safely. Work with Jack. Write warnings that really do the job. Write a manual that makes safe operations of these things as foolproof as possible." She smiles and adds, "When you're finished with the manual, put your engineer's hat back on and work on making these machines safer."

Warnings and manuals are just two of the many things you may have to do in technical communication. This first chapter introduces you to that world in a general way. The chapters that follow show you how to do manuals and warnings and much more.

chapter 1

An Overview of Technical Writing

▶ Some Matters of Definition

▶ The Substance of Technical Writing

▶ The Nature of Technical Writing

▶ The Attributes of Good Technical Writers

▶ The Qualities of Good Technical Writing

▶ A Day in the Life of Two Technical Writers

Marie Enderson: Computer Specialist and
    Occasional Technical Writer
Ted Freedman: Technical Writer and Company Editor

This first chapter is purely introductory. It is intended to give you the broadest possible view of technical writing. Beginning with Chapter 2, we go into details, but in order to be meaningful, these details must be seen against the background given here.

SOME MATTERS OF DEFINITION

As you work your way through this book, you will see that technical writing is essentially a problem-solving process that involves the following elements at one or more stages of the process:

- A technical subject matter that is peculiar to or characteristic of a particular art, science, trade, technology, or profession.
- A recognition and accurate definition of the communication problem involved.
- The beginning of the solution through the establishment of the role of the communicator and the purpose and audience (or audiences) of the communication.
- Discovery of the accurate, precise information needed for the solution of the problem through thinking, study, investigation, observation, analysis, experimentation, and measurement.
- The arrangement and presentation of the information thus gained so that it achieves the writer's purpose and is clear, useful, and persuasive.

The final product of this problem-solving process is a piece of technical writing that may range in size and complexity from a simple memorandum to a stack of books. To expand our overview of technical writing, we discuss it under these five headings:

The Substance of Technical Writing
The Nature of Technical Writing
The Attributes of Good Technical Writers

The Qualities of Good Technical Writing
A Day in the Life of Two Technical Writers

THE SUBSTANCE OF TECHNICAL WRITING

Organizations produce technical writing for internal and external use. Internally, documents such as feasibility reports, technical notes, e-mail, and memorandums go from superiors to subordinates, from subordinates to superiors, and between colleagues at the same level. If documents move in more than one direction, they may have to be drafted in more than one version. Company policy, tact, and the need to know are important considerations for intra-company paperwork.

Many examples come to mind. The director of information services studies and reports on the feasibility of providing middle management with personal computers. The research department reports the results of tests on new products. The personnel department instructs new employees about company policies and procedures. In fact, the outsider cannot imagine the amount and variety of paperwork a company generates simply to keep its internal affairs in order. Survey research indicates that college-educated employees spend about 20% of their time on the job writing.[1] In fact, most college-educated workers rank the ability to write well as very important or critically important to their job performance.[2]

Externally, letters and reports of many kinds go to other companies, the government, and the users of the company's products. Let us cite a few of the many possibilities: a computer company prepares instructional manuals to accompany its computers; a university department prepares a proposal to a state government offering to provide research services; an architectural firm prepares progress reports to inform clients of the status of contracted building programs; an insurance company writes letters accepting or denying claims by its policyholders.

The manufacture of information has become a major industry in its own right. Much of that information is research related. Many government agencies, scientific laboratories, and commercial companies make research their principal business. They may undertake this research to satisfy their internal needs or the needs of related organizations. The people who conduct the research may include social scientists, computer scientists, chemists, physicists, mathematicians, psychologists—the whole array of professional specialists. They record and transmit much of this research via reports. The clients for such research may be government agencies or other institutions that are not equipped to do their own research. Reports may, in fact, be the only products of some companies and laboratories.

Much technical writing goes on at universities and colleges. Professors have a personal or professional curiosity that entices them into research. If they believe that their findings are important, they publicize the information in various ways—books, journal articles, papers for professional societies, the Internet. Students assigned research problems present what they have done and learned in laboratory reports, monographs, and theses.

Many reports are prepared for public use. For example, a state department of natural resources is entrusted not only with conserving woodlands, wetlands, and wildlife but also with making the public aware of these resources. State and federally supported agricultural extension services have as a major responsibility the preparation and dissemination of agricultural information for interested users. Profit-earning companies have to create and improve their public image and also attract customers and employees. Airlines, railroads, distributors of goods and services, all have to keep in the public view. Pamphlets, posted notices, World Wide Web sites, and radio and television announcements are commonly used to meet these needs.

Myriad applications such as these—company memos and reports, government publications, research reports, public relations releases—create a great flood of information. Some of it is of only passing interest; some of it makes history. Some of it is prepared by full-time professional writers, but most of it is prepared by professionals in a technical field who are writing about their own work.

THE NATURE OF TECHNICAL WRITING

Technical writing, whether done by professional writers or professionals in a technical field, is a specialty within the field of writing as a whole. It requires a working knowledge of the technical subject matter and terminology. People working with technical documents need to learn about document design, standards for abbreviations, the rules that govern the writing of numbers, the uses of tables and graphs, and the needs and expectations of people who use technical documents.

And yet a broad and sound foundation in other writing is a tremendous asset for those who write technical documents, for it gives them versatility both on and off the job. They can write a good letter, prepare a brochure, compose a report. In this comprehensive sense, they are simply *writers.* The same writing skills that are important in a college classroom are important on the job. Surveys show that workers rank writing skills in this order of importance:[3]

1. Clarity
2. Conciseness
3. Organization
4. Grammar

Writers understand, too, that not all writing is done in the same tone and style. As writers, they have not one style but a battery of them:

. . . the very nice plant my mother had on her table in the front hall. Everyday, homey diction; much depends on the reader's imagination

. . . in a shaft of yellow sunlight, a white-flowering begonia in a red clay pot. Pictorial, vivid, sensory; shows, rather than tells

. . . a 12-inch begonia propagated from a 3-inch cutting; age, 42 days. Specific, technical, factually informative

As someone who writes technical documents, whether part-time or full-time, you may have to use all of these styles, for your job will be to convey your message to your intended readers. By playing the right tune with these styles in different combinations, and by adding other writing skills in generous measure, you can produce leaflets, proposals, brochures, sales literature, reports to stockholders, and a great variety of letters.

In writing intended for your professional colleagues, you will be nearer to the third begonia example than to the first two. Your diction will be objective and accurate. By relying on this style, you can produce operating manuals, feasibility reports, research reports, progress reports, and similar materials. When your audience and purpose are appropriate for this style, your writing is likely to have these characteristics:

- Your purpose is usually spelled out in the first one or two paragraphs. All included information bears upon the accomplishment of the stated purpose. For example, a technical paper on smoke detectors may set forth only one major objective: to determine the relative effectiveness of photoelectric and ionization chamber types in detecting smoldering fires, flaming fires, and high temperatures. Other major topics would be reserved for other papers.
- The vocabulary tends to be specialized. Some of the terms may not appear in general dictionaries. If the audience shares the writer's specialization, such terms may not be defined within the text, on the assumption that professional colleagues will be familiar with them. At other times, the terms may be listed and defined in accompanying glossaries.
- Sentences are highly specific and fact filled.
- When appropriate to the material, numbers and dimensions are plentiful.
- Signs, symbols, and formulas may pepper the text.
- Graphs and tables may substitute for prose or reinforce and expand on the surrounding prose. Figures and illustrations of all sorts are widely used, sometimes to supplement prose, sometimes to replace it.
- Documentation and credits appear in notes and bibliographies.

As this list makes clear, audience analysis is tremendously important to successful technical writing. What is appropriate for your professional colleagues may be inappropriate for the general public. In matters of definition, for example, terms are not normally defined if the audience is expected to know them. But the indispensable corollary to that proposition is that terms *have to be defined* when your audience, for whatever reason, cannot be expected to know them. Sentences can be fact filled when the audience is highly professional and highly motivated. However, when your readers do not share your motivation, profession, and enthusiasm, you should slow your pace and make your prose less dense. In technical writing, you have to know your audience as well as your objectives and adapt your style and material to both.

THE ATTRIBUTES OF GOOD TECHNICAL WRITERS

To write clear and effective reports, you build on the natural talents you have in communicating ideas to others. How can you build successfully? What skills, characteristics, and attitudes are of most value to the technical writer? From experience, we can summarize some of the major attributes that will stand you in good stead:

- Be reasonably methodical and painstaking. Plan your work for the day and for the rest of the week. Look up from time to time to take stock of what you and others are doing, so that you do not squander your time and energy on minor tasks that should be put off or dispensed with altogether. File your correspondence. Keep at your desk the supplies you need to do your work. Keep a clear head about ways and means for accomplishing your purpose.
- Be objective. Try not to get emotionally attached to anything you have written; be ready to chuck any or all of it into the wastebasket. While reading your own prose or that of your colleagues, do not ask whether you or they are to be pleased but whether the intended audience will be pleased, informed, satisfied, and persuaded.
- In your research, keep in mind that most of what you do will eventually have to be presented in writing. Do your work so that it will be honestly and effectively reportable. Keep a notebook, a computer journal, or a deck of note cards. Record what you do and learn.
- Never forget that *clarity* is your most important attribute. Until the sense of a piece of writing is made indisputably clear, until the intended reader can understand it, nothing else can profitably be done with it.
- As someone who writes, understand that writing is something that can be learned, even as chemistry, physics, and mathematics can be. The rules of writing are not as exact as those of science, but they can never be thrown overboard if you are to bring your substance home to your reader.

One writer, who knew well the nature and substance of technical writing, summed up the way to be successful with three imperatives that underlie much of this book:

1. Know your reader.
2. Know your objective.
3. Be simple, direct, and concise.[4]

THE QUALITIES OF GOOD TECHNICAL WRITING

Because the qualities of good technical writing vary, depending on audience and objective, we cannot offer you a list that applies equally to everything you write. However, some qualities are apparent in good technical writing. Good technical writing

- Arrives by the date it is due.
- Is well designed. It makes a good impression when it is picked up, handled, and flipped through or read online.
- Has the necessary preliminary or front matter to characterize the report and disclose its purpose and scope.
- Has a body that provides essential information and that is written clearly, without jargon or padding.
- When appropriate, uses tables and graphs to present and clarify its content.
- Has, when needed, a summary or set of conclusions to reveal the results obtained.
- Has been so designed that it can be read selectively—for instance, by some users, only the summary; by other users, only the introduction and conclusions; by still other users, the entire report.
- Has a rational and readily discernible plan, such as may be revealed by the table of contents and a series of headings throughout the report.
- Reads coherently and cumulatively from beginning to end.
- Answers readers' questions as these questions arise in their minds.
- Conveys an overall impression of authority, thoroughness, soundness, and honest work.

Beyond all these basic characteristics, good technical writing is free from typographical errors, grammatical slips, and misspelled words. Little flaws distract attention from the writer's main points.

A DAY IN THE LIFE OF TWO TECHNICAL WRITERS

To summarize, let us describe two representative writers, whom we shall identify as Marie Enderson and Ted Freedman.

Marie Enderson: Computer Specialist and Occasional Technical Writer

Marie has a bachelor's degree in engineering technology. She works in the information services division of a small electronics company that employs some 400 people. Marie has been with the company for a little over a year. Since her

childhood, she has been recognized as a whiz at mathematics. In college, she was drawn to the use and design of computing systems. Her major responsibility is to provide technical support for computer systems users in the company.

Marie's first project with the company was to design an automated system for the shipping department. She interviewed the supervisors and workers in the department to establish the department's needs. She then matched the needs to available off-the-shelf equipment and programs and designed a system to automate much of the department's work. After finishing her design, she had to prepare a written report and oral briefing describing it for the shipping department and her boss. She had a ghastly time the next two weeks. She found, as do many novice writers, that she knew what she wanted to say but not where or how to say it. The ten-page report did somehow get written and, after a thorough overhaul by Ted Freedman (whom we'll meet next), was presented. Her oral report was a summary of the written report, and it was well received. Her system design was accepted and will be implemented in several months.

Marie's first experience with on-the-job technical writing taught her four important things: (1) An engineer is not simply a person whose only product is a new design or a gadget that works; (2) things that go on in your head and hands are lost unless they are recorded; (3) writing about what you have thought and done is a recurring necessity; and (4) technical writing, strange and difficult as it may seem at first, is something that can be learned by anyone of reasonable intelligence and perseverance.

Marie's present project is to write a set of instructions for the accounting department to help them use an automated system that was installed over a year ago. Marie's predecessor had installed the equipment and furnished the accountants a set of the manuals produced by the computer and program manufacturers. The manuals are well written, but because they are written by different manufacturers for a general audience, they do not integrate the components of the system in a way meaningful to the accountants. Marie has studied the system and interviewed the users to determine their needs. She has drafted a twenty-page booklet that supplements the manufacturer's manuals and shows the accountants how to use the new equipment and programs in their work. She has sent the draft to Ted Freedman for his comments.

Ted Freedman: Technical Writer and Company Editor

Ted Freedman was hired three years ago by the company as a technical writer–editor. He holds a bachelor's degree in technical communication. His office is a sparsely furnished cubicle down the hall from the publications and mailing departments. His office furnishings include a brand-new personal computer and printer, a four-foot shelf of dictionaries and reference manuals, and an extra-large wastepaper basket.

At 8:45 this morning Ted is scheduled for a project review session in the company auditorium. He arrives at the auditorium with five minutes to spare. For the next hour he studies flip charts, slide projections on the huge screen, chalk-and-blackboard plans for company reorganization (minor), and staffing proposals for three new projects totaling $778,400. From the platform, Chief Scientist Muldoon requests that Ted develop research timetables and preview reporting needs.

At 10:20 he meets with a commercial printer to examine the artwork and layout for a plush report the company is preparing for a state commission. The work looks good but needs a little typographical variety, he suggests.

At 12:55, back from lunch in the company cafeteria, Ted glances over the memos that collected on his desk during the morning—nothing urgent. Then he opens the manila envelope lying in his mail rack. In it is a computer disk that contains Marie's instructional booklet and a printout of the booklet.

At 1:30 he calls Marie and arranges for a meeting at 3:00 so that they can run through the draft together. In the meantime he looks over the printout. He notices some computer jargon. He is pretty sure the accountants would not have a clear idea of the distinction between Standard Generalized Markup Language (SGML) and American Standard Code for Information Interchange (ASCII). He circles both phrases. Reading on, he finds a spot where the text should be supported by a graphic. He makes a note of it in the margin. He realizes that the booklet would be more accessible to the reader with more headings in it. He puts Marie's disk into his word processor and, scrolling through her text on the screen, inserts headings that fit her arrangement and material. Thus, the afternoon wears on.

At 3:00, Marie arrives and the two confer, make changes, and plan later alterations in the draft. As before, they work amicably together. They intersperse their writing and editing with an occasional trip to the water cooler, a chat with a department head, and a visit to the World Wide Web to consult a specialized reference work.
Ted is good at his work and is considered to have a great future with the company.

Marie and Ted are roughly representative of many thousands of technical writer–editors. Most of them, like Marie, are not professional technical writers. They write as the need arises, to report or instruct. To gain a more rounded understanding of their duties and behavior, we would have to pay them many additional visits; however, certain things are evident even from this brief visit. Like most writers on the job, they work in collaboration with others. Also, much of the time they are not writing at all, in the popular sense. Some of the time they are simply listening hard to what people are saying to one another—trying to clarify, simplify, and translate into other terms. A generous portion of their time is

spent on tasks that have little direct connection with writing but eventually provide grist for the writing mill. The techniques, tools, and processes that writers such as Ted and Marie need to accomplish their work are the subject matter of this book.

EXERCISES

1. As your instructor directs, bring to class one or more documents that you believe to be technical. In groups of four or five discuss the documents. In what respects is the writing technical? Subject matter? Purpose? Tone? Specialized vocabulary? How has the writer used numbers, formulas, tables, and graphs? Are there headings and transitional features that guide readers through the document? Is it easy to scan the document and select certain parts of it for more intensive reading? In a class discussion, present your group's conclusions to the class.
2. Rewrite a brief paragraph of technical prose (perhaps a document submitted in Exercise 1) to substantially lower its technical level. Explain what you have done and why.
3. Examine several periodicals in your discipline. In what ways and to what extent does your examination of such periodicals confirm or change your first impressions of technical writing?
4. As your instructor directs, bring to class examples of technical and scientific writing for a lay audience, as opposed to a technical audience. You can find such examples in *Discover* or the science section of a news magazine like *Time* or *Newsweek.* Also, instructions for mechanisms such as compact disc players and VCRs are written for a lay audience. In groups of four or five, compare these examples to examples chosen from the periodicals you examined for Exercise 3. Present the conclusions your group reaches from this examination in a class discussion.
5. In two columns, list your assets and limitations as a technical writer.