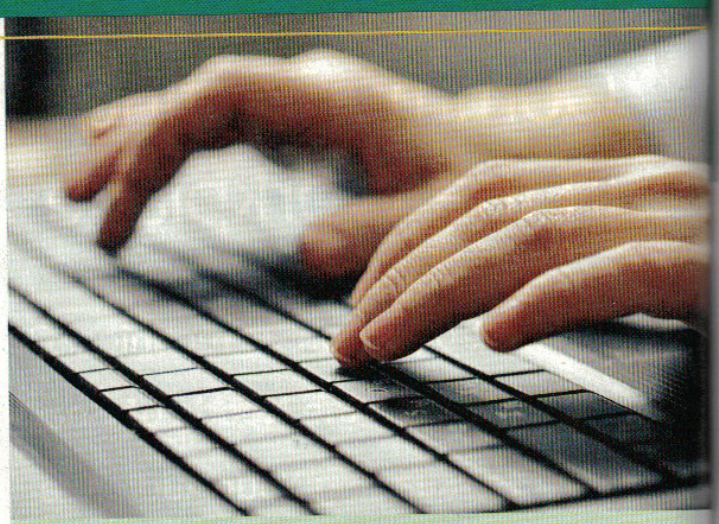
1 Introduction to Technical Communication



"Writing is essential to my work. Everything we do at my company results in a written product of some kind—a formal technical report, a summary of key findings, recommendations and submissions to academic journals or professional associations. We also write proposals to help secure new contracts. Writing is the most important skill we seek in potential employees and nurture and reward in current employees. It is very hard to find people with strong writing skills, regardless of their academic background."

—Paul Harder, President, mid-sized consulting firm

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LEARNING OBJECTIVES FOR THIS CHAPTER

- Define technical communication
- Recognize the digital and human sides of technical communication
- Understand that technical communication has a global reach
- Appreciate the role of technical communication in most careers
- Know what technical communicators do
- Identify the main features of technical communication
- Explain the purposes of technical communication
- Describe the four tasks involved in preparing effective technical documents

WHAT IS TECHNICAL COMMUNICATION?

▸ Define technical communication

Technical communication is the exchange of information that helps people interact with technology and solve complex problems. Almost every day, we make decisions or take actions that depend on technical information. When we install any new device, from a microwave oven to a new printer, it's the setup information that we look for as soon as we open the box. Before we opt for the latest high-tech medical treatment, we learn all we can about its benefits and risks. From banking systems to online courses to business negotiations, countless aspects of daily life are affected by technology. To interact with technology in so many ways, we need information that is not only technically accurate but also easy to understand and use.

Technical communication helps us interact with technology in our daily lives

Technical communication serves various needs in various settings. People may need to perform a task (say, assemble a new exercise machine), answer a question (say, about the safety of a flu shot), or make a decision (say, about suspending offshore oil drilling). In the workplace, we are not only consumers of technical communication, but producers as well. Any document or presentation we prepare (memo, letter, report, Web page, PowerPoint) must advance the goals of our readers, viewers, or listeners.

Technical communication helps us solve complex problems

Figure 1.1 shows a sampling of the kinds of technical communication you might encounter or prepare, either on the job or in the community.

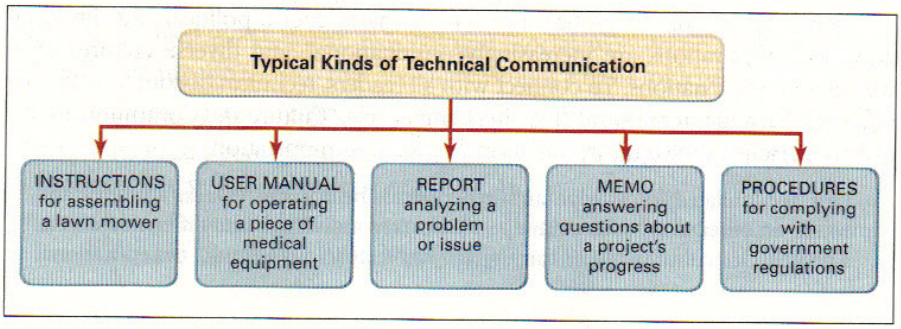


FIGURE 1.1 Technical Communication Serves Various Needs

TECHNICAL COMMUNICATION IS A DIGITAL *AND* A HUMAN ACTIVITY

▶ Recognize the digital and human sides of technical communication

Digital communication requires attention to style and tone

In today's workplace, we communicate more than ever, especially via email, texting, video conferencing, and social networks. Digital technology makes it easy to bring people together, especially across different time zones or work schedules. Yet online, we communicate with such speed that we often forget about basic professional standards for workplace communication. For instance, the informal or even humorous tone we use to text our friends is typically not appropriate for a work-related email. An unclear or inaccurate email could easily cause a safety error or legal problem; an inappropriate tone might result in wasted hours resolving an interpersonal situation instead of working on the project.

Online research is not the same as critical thinking

Digital technology also provides plenty of ways, from simple to sophisticated, to research and find information. Just conducting an Internet search, however, is not a substitute for critical thinking skills. The big questions involved in most workplace projects are questions that require us to take our research findings and make the information meaningful by asking questions such as these:

Questions that only a person can answer

- Which information is relevant to this situation?
- Can I verify the accuracy of this source?
- What does this information mean?
- What action does it suggest?
- How does this information affect me or my colleagues?
- With whom should I share it?
- How might others interpret this information?

TECHNICAL COMMUNICATION REACHES A GLOBAL AUDIENCE

▶ Understand that technical communication has a global reach

Write to a diverse audience

Electronically linked, our global community shares social, political, and financial interests. Corporations are increasingly multinational, and diverse cultures exist within individual nations. To connect with all readers, technical documents need to reflect global and intercultural diversity. In his article, "Culture and Communication," Robert G. Hein defines culture and its impact on communication:

How cultures shape communication styles

> Our accumulated knowledge and experiences, beliefs and values, attitudes and roles—in other words, our cultures—shape us as individuals and differentiate us as a people. Our cultures, inbred through family life, religious training, and educational

> and work experiences ... manifest themselves ... in our thoughts and feelings, our actions and reactions, and our views of the world.
>
> Most important for communicators, our cultures manifest themselves in our information needs and our styles of communication ... our expectations as to how information should be organized, what should be included in its content, and how it should be expressed. (125)

Cultures differ over which behaviors seem appropriate for social interaction, business relationships, contract negotiation, and communication practices. An effective communication style in one culture may be offensive elsewhere. For example, one survey of top international executives reveals the following attitudes toward U.S. communication style (Wandycz 22–23):

How various cultures view U.S. communication style

- Latin America: "Americans are too straightforward, too direct."
- Eastern Europe: "An imperial tone ... It's always about how [Americans] know best."
- Southeast Asia: "To get my respect, American business [people] should know something about [our culture]. But they don't."
- Western Europe: "Americans miss the small points."
- Central Europe: "Americans tend to oversell themselves."

In addition to being broadly accessible, any document prepared for a global audience must reflect sensitivity to cultural differences. For more on cross-cultural communication, see Chapters 3 and 5.

TECHNICAL COMMUNICATION IS PART OF MOST CAREERS

▸ Appreciate the role of technical communication in most careers

Whatever your job description, expect to be evaluated, at least in part, on your communication skills. At one IBM subsidiary, for example, 25 percent of an employee's evaluation is based on how effectively that person shares information (Davenport 99). Even if you don't anticipate a "writing" career, expect to be a part-time technical communicator, who will routinely face situations such as these:

Most professionals serve as part-time technical communicators

- As a medical professional, psychologist, social worker, or accountant, you will keep precise records that are, increasingly, a basis for legal action.
- As a scientist, you will report on your research and explain its significance.
- As a manager, you will write memos, personnel evaluations, and inspection reports; you will also give oral presentations.
- As a lab or service technician, you will keep daily activity records and help train coworkers in installing, using, or servicing equipment.

- As an attorney, you will research and interpret the law for clients.
- As an engineer or architect, you will collaborate with colleagues as well as experts in related fields before presenting a proposal to your client. (For example, an architect's plans are reviewed by a structural engineer who certifies that the design is sound.)
- As an employee or intern in the nonprofit sector (an environmental group or a government agency), you will research important topics and write brochures, press releases, or handbooks for clients.

The more you advance in your field, the more you will need to share information and establish contacts. Managers and executives spend much of their time negotiating, setting policies, and promoting their ideas—often among diverse cultures around the globe.

In addition, most people can expect to work for several different employers throughout their career. Each employer will have questions such as the following:

Employers seek portable skills

- Can you write and speak effectively?
- Can you research information, verify its accuracy, figure out what it means, and shape it for the reader's specific purposes?
- Can you work on a team, with people from diverse backgrounds?
- Can you get along with, listen to, and motivate others?
- Are you flexible enough to adapt to rapid changes in business conditions and technology?
- Can you market yourself and your ideas persuasively?
- Are you ready to pursue lifelong learning and constant improvement?

These are among the portable skills employers seek in today's college graduates—skills all related to communication.

TECHNICAL COMMUNICATORS PLAY MANY ROLES

▶ Know what technical communicators do

What technical communicators do

Full-time technical communicators serve many roles. Trade and professional organizations employ technical communicators to produce newsletters, pamphlets, journals, and public relations material. Many work in business and industry, preparing instructional material, reports, proposals, and scripts for industrial films. They also prepare sales literature, publicity releases, handbooks, catalogs, brochures, Web pages, intranet content, articles, speeches, and oral and multimedia presentations.

Related career paths

Technical communicators also do other work. For example, they edit reports for punctuation, grammar, style, and logical organization. They may also oversee publishing projects, coordinating the efforts of writers, visual artists, graphic designers,

content experts, and lawyers to produce a complex manual or proposal. Given their broad range of skills, technical communicators often enter related fields such as publishing, magazine editing, Web site management, television, and college teaching.

MAIN FEATURES OF TECHNICAL COMMUNICATION

▶ Identify the main features of technical communication

Almost any form of technical communication displays certain shared features: The communication is reader-centered, accessible and efficient, often produced by teams, and delivered in both paper and digital versions.

Reader-Centered

Focus on the reader, not the writer

Unlike poetry, fiction, or college essays, a technical document rarely focuses on the writer's personal thoughts and feelings. This doesn't mean that your document should have no personality (or voice), but it does mean that the needs of your readers come first.

What readers expect

Workplace readers typically are interested in "who you are" only to the extent that they want to know what you have done, what you recommend, or how you speak for your company. Reader-centered documents focus on what people need to learn, do, or decide.

Accessible and Efficient

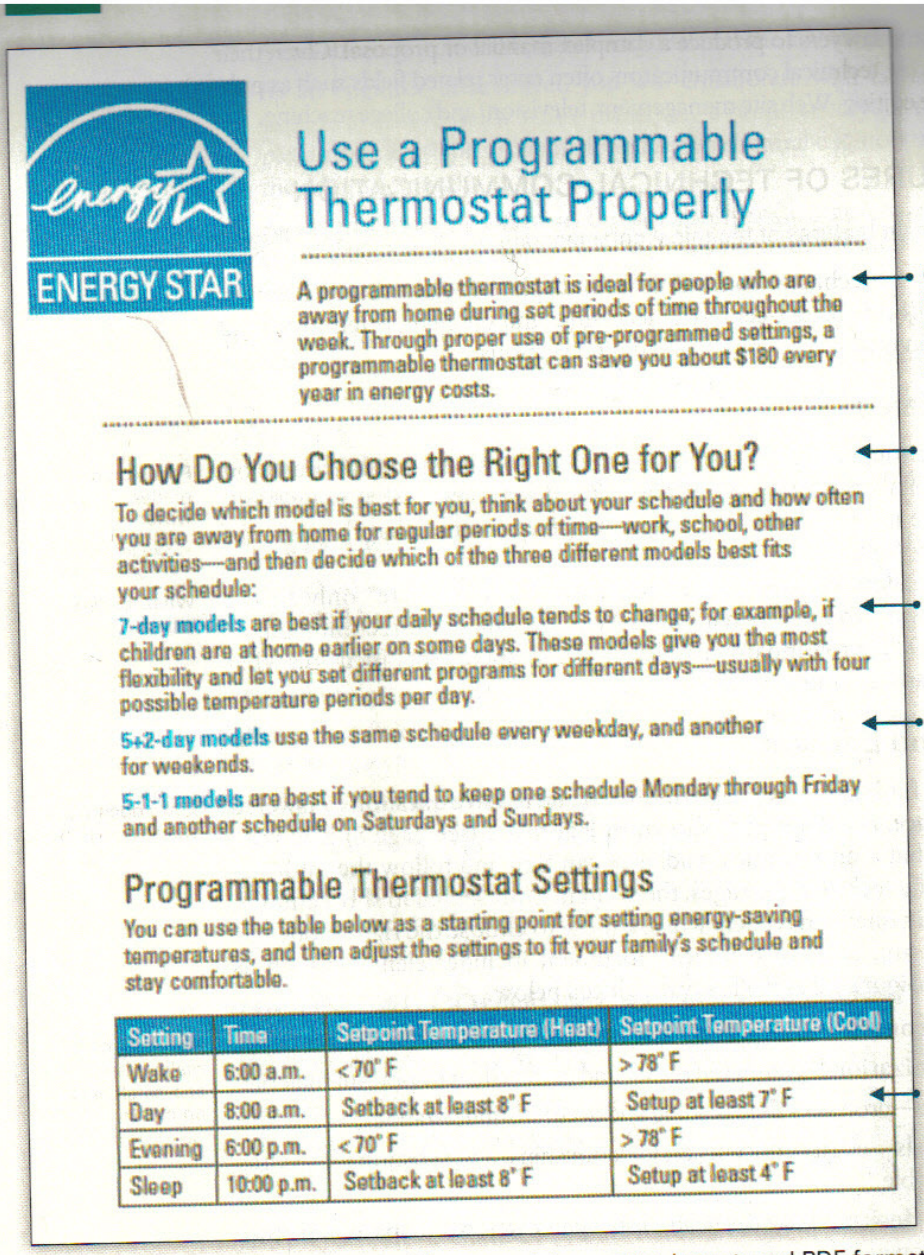
Make documents easy to navigate and understand

Readers expect to find the information they need and to have questions answered clearly. For instance, the document shown in Figure 1.2 (see page 8) is written and designed so that a nontechnical audience can find and follow the information. Instead of long technical passages, the content is presented in short chunks, answering the main question readers will ask (how to choose the right model).

An accessible and efficient technical document includes elements such as those displayed in Figure 1.2 as well as others listed below.

Elements that make a document accessible and efficient

- **worthwhile content**—includes all (and only) the information readers need
- **sensible organization**—guides the reader and emphasizes important material
- **readable style**—promotes fluid reading and accurate understanding
- **effective visuals**—clarify concepts and relationships, and substitute for words whenever possible
- **effective page design**—provides heads, lists, type styles, white space, and other aids to navigation
- **supplements (abstract, appendix, glossary, linked pages, and so on)**—allow readers to focus on the specific parts of a long document that are relevant to their purpose



Use a Programmable Thermostat Properly

A programmable thermostat is ideal for people who are away from home during set periods of time throughout the week. Through proper use of pre-programmed settings, a programmable thermostat can save you about $180 every year in energy costs.

How Do You Choose the Right One for You?

To decide which model is best for you, think about your schedule and how often you are away from home for regular periods of time—work, school, other activities—and then decide which of the three different models best fits your schedule:

7-day models are best if your daily schedule tends to change; for example, if children are at home earlier on some days. These models give you the most flexibility and let you set different programs for different days—usually with four possible temperature periods per day.

5+2-day models use the same schedule every weekday, and another for weekends.

5-1-1 models are best if you tend to keep one schedule Monday through Friday and another schedule on Saturdays and Sundays.

Programmable Thermostat Settings

You can use the table below as a starting point for setting energy-saving temperatures, and then adjust the settings to fit your family's schedule and stay comfortable.

Setting	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Wake	6:00 a.m.	< 70° F	> 78° F
Day	8:00 a.m.	Setback at least 8° F	Setup at least 7° F
Evening	6:00 p.m.	< 70° F	> 78° F
Sleep	10:00 p.m.	Setback at least 8° F	Setup at least 4° F

Overview information summarizes the document's main point

Heading is phrased as the main question readers will ask

Paragraphs and sentences are short

Color is used to highlight key items

Table provides easy-to-read comparative data

FIGURE 1.2 **An Effective Technical Document** Language, layout, and PDF format make the information easy for everyday readers to understand and access.

Source: A Guide to Energy-Efficient Heating and Cooling, Energy Star Program, August 2009.

Accessible, efficient communication is no mere abstract notion: In the event of a lawsuit, faulty writing is treated like any other faulty product. If your inaccurate, unclear, or incomplete information leads to injury, damage, or loss, you and your company or organization can be held responsible.

Recognize your legal accountability

NOTE *Make sure your message is clear and straightforward—but do not oversimplify. Information designer Nathan Shedroff reminds us that, while clarity makes information easier to understand, simplicity is "often responsible for the 'dumbing down' of information rather than the illumination of it" (280). The "sound bytes" that often masquerade as network news reports serve as a good case in point.*

Often Produced by Teams

Technical documents are often complex. Instead of being produced by a lone writer, complex documents usually are created by teams composed of writers, Web designers, engineers or scientists, managers, legal experts, and other professionals. The teams might be situated at one site or location or distributed across different job sites, time zones, and countries.

Prepare for teamwork

Delivered in Paper and Digital Versions

Technical documents can be delivered in a variety of media such as print (hard copy), CDs, Web pages, PDF documents, ebooks, podcasts, and online videos. In many cases, distinctions between print and digital communication are becoming blurred. Figure 1.2 is a good example: The document is in PDF format and can be read on the Web, downloaded to a computer, phone, or tablet for future reading, or printed on paper. Technical communicators must write well but must also be able to think about page design and media choices.

Select the appropriate medium or combination of media

PURPOSES OF TECHNICAL COMMUNICATION

▶ Explain the purposes of technical communication

Most forms of technical communication address one of three primary purposes: (1) to anticipate and answer questions (inform your readers); (2) to enable people to perform a task or follow a procedure (instruct your readers); or (3) to influence people's thinking (persuade your readers). Often, as in Figure 1.2, these purposes will overlap.

What purpose or combination of purposes will your document serve?

Documents that Inform

Informational documents are designed to inform—to provide information that answers readers' questions clearly and efficiently. Figure 1.2 is primarily informational. It is designed for a wide audience of readers who may have questions but know little about the technical details.

Anticipate and answer your readers' questions

Documents that Instruct

Enable your readers to perform certain tasks

Instructional documents help people do something: assemble a new computer, perform CPR, or, in the case of Figure 1.2, use a programmable thermostat properly. This page, part of a longer document on energy-efficient heating and cooling, provides basic instructions to help people decide how to choose the most suitable thermostat for their needs. Action verbs and phrases, such as "think about your schedule" and "decide which of the three models best fits," are clear and direct. A simple table provides visual instructions on how and when to set thermostat temperatures.

Documents that Persuade

Motivate your readers

Persuasion encourages people to take a desired action. While some documents (such as a sales letter) are explicitly persuasive, even the most technical of documents can have an implicitly persuasive purpose. The first paragraph of Figure 1.2, for example, encourages readers to use a programmable thermostat by pointing out how much a person could save in yearly energy bills.

PREPARING EFFECTIVE TECHNICAL DOCUMENTS

▶ Describe the four tasks involved in preparing effective technical documents

Whether you are a full-time communication professional or an engineer, nurse, scientist, technician, legal expert, or anyone whose job requires writing and communicating, the main question you face is this: "How do I prepare the right document for this group of readers and this particular situation?"

A main question you must answer

Other chapters in this book break down the process in more detail. In Chapter 2, for example, you will learn about analyzing the audience and purpose for any document and situation. Later, you will see examples of document types typically used in workplace environments. But regardless of the type, producing an effective document typically requires that you complete the four basic tasks depicted in Figure 1.3 and described below.

A workplace communicator's four basic tasks

- **Deliver information readers can use**—because different people in different situations have different information needs. (Chapter 2)
- **Use persuasive reasoning**—because people often disagree about what the information means and what action should be taken. (Chapter 3)
- **Weigh the ethical issues**—because unethical communication lacks credibility and could alienate readers. (Chapter 4)
- **Practice good teamwork**—because working in teams is how roughly 90 percent of U.S. workers spend some part of their day ("People" 57). (Chapter 5)

The short cases that follow illustrate how a typical professional confronts these tasks in her own day-to-day communication on the job.

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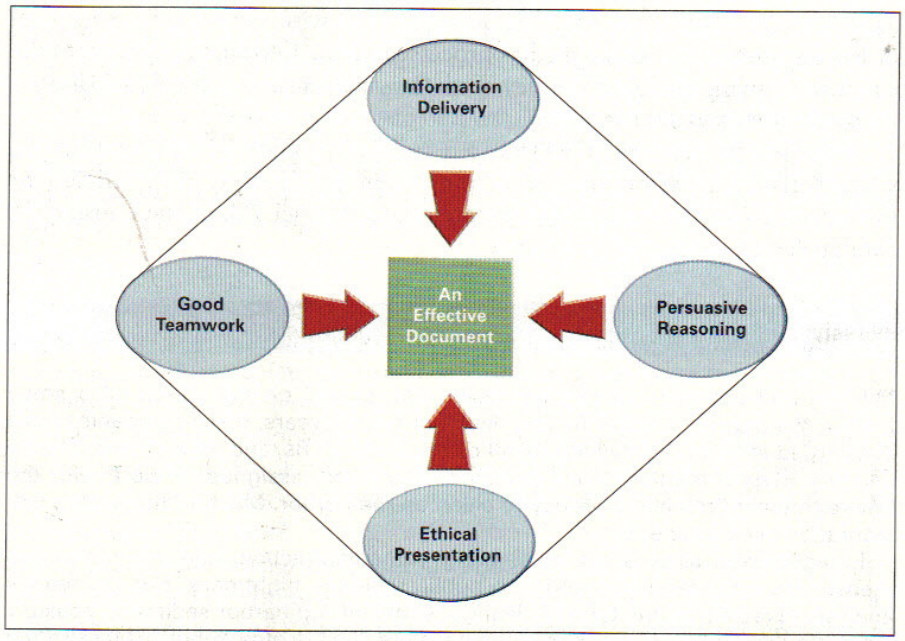

FIGURE 1.3 **How an Effective Document Is Produced**

CASE Providing Information Readers Can Use

"Can I provide exactly what readers need?"

Sarah Burnes was hired two months ago as a chemical engineer for Millisun, a leading maker of cameras, multipurpose film, and photographic equipment. Sarah's first major assignment is to evaluate the plant's incoming and outgoing water. (Waterborne contaminants can taint film during production, and the production process itself can pollute outgoing water.) Management wants an answer to this question: How often should we change water filters? The filters are expensive and hard to change, halting production for up to a day at a time. The company wants as much "mileage" as possible from these filters, without either incurring government fines or tainting its film production.

Sarah will study endless printouts of chemical analysis, review current research and government regulations, do some testing of her own, and consult with her colleagues. When she finally determines what all the data indicate, Sarah will prepare a recommendation report for her bosses.

Later, Sarah will collaborate with the company training manager and the maintenance supervisor to prepare a manual, instructing employees on how to check and change the filters. To cut publishing costs, the company has asked Sarah to design and produce this manual using its desktop publishing system.

Sarah's report, above all, needs to be accurate; otherwise, the company gets fined or lowers production. Once she has processed all the information, she faces the problem of giving readers what they need: *How much explaining should I do? How will I organize the manual? Do I need visuals?* And so on.

In other situations, Sarah will face a persuasion problem as well, for example, when decisions must be made or actions taken on the basis of incomplete or inconclusive facts or conflicting interpretations (Hauser 72). In these instances, Sarah will seek consensus for *her* view.

CASE Being Persuasive

"Can I influence people to see things my way?"

Millisun and other electronics producers are located on the shores of a small harbor, the port for a major fishing fleet. For twenty years, these companies have discharged effluents containing metal compounds, PCBs, and other toxins directly into the harbor. Sarah is on a multicompany team, assigned to work with the Environmental Protection Agency to clean up the harbor. Much of the team's collaboration occurs via email.

Enraged local citizens are demanding immediate action, and the companies themselves are anxious to end this public relations nightmare. But the team's analysis reveals that any type of cleanup would stir up harbor sediment, possibly dispersing the solution into surrounding waters and the atmosphere. (Many of the contaminants can be airborne.) Premature action might actually increase danger, but team members disagree on the degree of risk and on how to proceed.

Sarah's communication here takes on a persuasive dimension: She and her team members first have to resolve their own disagreements and produce an environmental impact report that reflects the team's consensus. If the report recommends further study, Sarah will have to justify the delays to her bosses and the public relations office. She will have to make other people understand the dangers as well as she does.

In the preceding case, the facts are neither complete nor conclusive, and views differ about what these facts mean. Sarah will have to balance the various political pressures and make a case for her interpretation. Also, as company spokesperson, Sarah will be expected to protect her company's interests. Some elements of Sarah's persuasion problem: *Are other interpretations possible? Is there a better way? Can I expect political or legal fallout?*

CASE Considering the Ethical Issues

"Can I be honest and still keep my job?"

To ensure compliance with OSHA[1] standards for worker safety, Sarah is assigned to test the air purification system in Millisun's chemical division. After finding the filters hopelessly clogged, she decides to test the air quality and discovers

[1] Occupational Safety and Health Administration.

dangerous levels of benzene (a potent carcinogen). She reports these findings in a memo to the production manager, with an urgent recommendation that all employees be tested for benzene poisoning. The manager phones and tells Sarah to "have the filters replaced," but says nothing at all about her recommendation to test for benzene poisoning. Now Sarah has to decide what to do about this lack of response: Assume the test is being handled, and bury the memo in some file cabinet? Raise the issue again, and risk alienating her boss? Send copies of her original memo to someone else who might take action?

As the preceding case illustrates, Sarah also will have to reckon with the ethical implications of her writing, with the question of "doing the right thing." For instance, Sarah might feel pressured to overlook, sugarcoat, or suppress facts that would be costly or embarrassing to her company.

Situations that compromise truth and fairness present the hardest choices of all: remain silent and look the other way, or speak out and risk being fired. Some elements of Sarah's ethics problem: *Is this fair? Who might benefit or suffer? What other consequences could this have?*

In addition to solving these various problems, Sarah has to work in a team setting: Much of her writing will be produced in collaboration with others (editors, managers, graphic artists), and her audience will extend beyond readers from her own culture.

CASE **Working on a Team and Thinking Globally**

Recent mergers have transformed Millisun into a multinational corporation with branches in eleven countries, all connected by an intranet. Sarah can expect to collaborate with coworkers from diverse cultures on research and development and with government agencies of the host countries on safety issues, patents and licensing rights, product liability laws, and environmental concerns. Also, she can expect to confront the challenges of addressing the unique needs and expectations of people from various cultures across the globe. She will need to be careful about how she writes her daily email status reports, for example, so that these reports convey respect for cultural differences.

"Can I connect with all these different colleagues?"

In order to standardize the sensitive management of the toxic, volatile, and even explosive chemicals used in film production, Millisun is developing automated procedures for quality control, troubleshooting, and emergency response to chemical leakage. Sarah has been assigned to a team that is preparing computer-based training packages and instructional videos for all personnel involved in Millisun's chemical management worldwide.

As a further complication, Sarah will have to develop working relationships with people she has never met face-to-face, people from other cultures, and people she knows only via an electronic medium.

For Sarah Burnes, or any of us, writing is a process of discovering what we want to say, "a way to end up thinking something [we] couldn't have started out thinking" (Elbow 15). Throughout this process in the workplace, we rarely work alone but instead collaborate with others for information, help in writing, and feedback.

Projects

MyWritingLab™

GENERAL

1. Write a memo to your boss, justifying reimbursement for this course. Explain how the course will help you become more effective on the job. (See Chapter 15 for memo elements and format.)
2. Locate a Web site for an organization that hires graduates in your major. In addition to technical knowledge, what writing and communication skills does this organization seek in job candidates? Discuss your findings in class and write a short memo to other students, explaining what communication skills they require in order to find a job in this or a similar organization.

TEAM

Introducing a Classmate

Class members will work together often this semester. To help everyone become acquainted, your task is to introduce to the class the person seated next to you. (That person, in turn, will introduce you.) Follow this procedure:

a. Exchange with your neighbor whatever personal information you think the class needs: background, major, career plans, communication needs of your intended profession, and so on. Each person gets five minutes to tell her or his story.
b. Take careful notes; ask questions if you need to.
c. Take your notes home and select only the information you think the class will find useful.
d. Prepare a one-page memo telling your classmates who this person is. (See Chapter 15 for memo elements and format.)
e. Ask your neighbor to review the memo for accuracy; revise as needed.
f. Present the class with a two-minute oral paraphrase of your memo, and submit a copy of the memo to your instructor.

DIGITAL AND SOCIAL MEDIA

With a team of 2–3 other students, visit a government Web site, such as the Food and Drug Administration, the Centers for Disease Control NASA, or the Environmental Protection Agency. Locate documents that are similar in purpose to Figure 1.2 in this chapter. Analyze these documents, noting whether they are available in PDF and whether they conform to one of the three purposes (informative, instructional, persuasive) described in this chapter or whether they are a blend of these purposes. Also, locate the Facebook page for NASA and compare it with NASA's Web site. How is content presented differently on each site? Does the Facebook page appear to have a different purpose from the Web site? If so, what are the differences?

GLOBAL

Look back at the Sarah Burnes case in this chapter. Assume that you are about to join a team at work, a team that has members from Ireland, India, China, and the United States. Use the Internet to learn what you can about patterns of communication; issues to look for include politeness, turn-taking, use of first names or titles, and gender roles. Describe your findings in a short memo to your instructor.

MyWritingLab™ Visit Chapter 1, *Introduction to Technical Communication*, in MyWritingLab to complete this chapter's applications, to explore this chapter's overview, checklist, and flashcards, and to test your understanding of the chapter objectives.