

ENGR 1181 – Lab 2 – Technical Communication Lab

Note: Special thanks to The Ohio State University. Content for the Technical Communications Lab is copied and adapted from the Department of Engineering Education's ENGR 1181 course

Background:

Space shuttle Challenger is one of the most famous and widely used ethical case studies. There are many reasons for this: the inherent, extreme safety factors related to spaceflight with people on-board; the shuttle program's status as one of the most complex technological systems ever devised coupled with the high-profile status of spaceflight (especially during the continuing Cold War of the 1980s); the extensive multidisciplinary nature of the work; and so on.

But the story's communication-related elements are what make it truly valuable. Part of this value is quantitative: the sheer amount of extant primary Challenger documentation and how much of it not only pinpoints the disaster's technical cause but also recommends (sometimes in undeniably strong terms) that the design be changed and all shuttle flights halted until that change takes place. This documentation began on October 21, 1977 and continued through January 27, 1986—the night before Challenger's destruction – thus creating a timeline nearly nine years long. Part of the value is qualitative: the failures in communication between MTI (vendor) and NASA customer often rest on how effectively the dangers are communicated for the intended audience or if the appropriate audience is actually provided with the information necessary for making an informed decision.

Another important element of Challenger-era communication was conflict. While it's far too reductive to boil the story down to binary opposites, there's no denying that engineering and management often saw things very differently and that these differences often concerned the notion of science; safety versus money; and deadlines. Perhaps the most significant conflict was between Morton-Thiokol, Inc. (MTI) as a vendor and NASA as its customer; in a very real way, MTI was selling a product to NASA, and this relationship dictated not only what MTI was willing to tell NASA but also what questions NASA was willing to ask its vendor. In fact, it's more than telling how little communication traveled between MTI and NASA—the vast majority of extant documentation was internal to each organization: i.e., they didn't talk to one another enough.

Take a look (or listen) to this interview with one of the MTI engineers:

<https://www.npr.org/sections/thetwo-way/2016/01/28/464744781/30-years-after-disaster-challenger-engineer-still-blames-himself>

Eight years after the NASA engineer Leon Roy's first documentation of the critical issues with the clevis joint, MTI engineer R.M. Boisjoly composed a memo informing MTI management that there was (still) a critical issue with the O-rings and joint. Link to Memo:

https://jodoran.wordpress.com/wp-content/uploads/2011/03/boisjoly-memo_1985.pdf

Objective:

The world is full of many obstacles waiting for engineers to understand and overcome them. Before any problem can be fully solved, though, the solution must be communicated with others who have the skills, resources, and presence to become part of that solution. By conceptualizing technical communications as another facet of problem solving, we can use our engineering skills to craft effective communications that achieve their purpose with the intended audience.

To aid in building these skills and establishing this concept, this lab contains two activities, each with several parts. First, your team will prepare for future assignments by compiling details about several different technical communication strategies, with each teammate becoming the local expert on one aspect of technical communication. Second, your team will approach the problem of one specific piece of technical communication – a memo related to the Challenger Space Shuttle tragedy – from two perspectives.

As a team, you will submit one PDF document containing all activities. It must follow formatting guidelines established in Chapter 8 of the Fundamentals of Technical Communication guidebook (Tech Comm Guide). Section headings should be included for each technical writing style & strategies of part 1, and each scenario of part 2. The Tech Comm Guide can be accessed using this link:

<https://ohiostate.pressbooks.pub/feptechcomm/>

Procedure:

Make sure that all team members have opened a copy of the memo, either printed or open or in a web browser. Each team member should also open the Tech Comm guide on their own computer.

PART 1: Tech Comm Writing Style Jigsaw

The goal of this assignment is to become familiar with the online Fundamentals of Engineering Technical Communications online textbook (Tech Comm Guide). Each group will have a “resident expert” on a sampling of different technical communication strategies and skill areas.

1. Assign each member of the team one of the technical writing topics and include the table below with the corresponding member's name.

Technical Writing Style & Strategies	Assigned Team Member
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"Concise" & "Precise" (subsections of Ch. 3)	
"Direct" & "Well Organized" (subsections of Ch. 3)	
Voice & Tone	
Mechanics and Grammar	

2. Answer the following questions about your assigned technical writing style feature. Be as clear as possible, as these summaries will be used by your team members throughout the next several weeks to help better understand the different writing style strategies.

1. Four main takeaways: summarize four main ideas from the reading in your own words for your group members.
2. How does using this writing style strategy affect readers? Why is it desirable in technical communications?

PART 2: The Challenger Memo Problem

The goals of this assignment are to 1) apply the technical writing process and values in a real-world application and 2) recognize the importance of audience when writing technical documents. Work with your team to complete the Challenger Memo Writing Scenario prompts below. Consider the purpose of the memo, audience, clarity of the memo, structure of information, language & writing style.

Scenario 1: Imagine you work for MTI and are writing the information in this memo as an email to your direct supervisor – what would you do differently to communicate the main idea more effectively?

As a team, complete and record all steps of the DR PIE Process.

- ***Define*** - State the purpose of this communication, your understanding of your relationship to the audience, what you expect the audience will do with the information you are presenting them, and what they will need from this email to be able to do that.
- ***Represent & Plan*** - Make an outline showing how you will organize your thoughts in a professional email to your direct supervisor.
- ***Implement*** - Write a complete formal email that successfully meets the objectives your team has defined in a concise, precise, direct, and well-organized way. This email should follow the guidance provided in Chapter 6 of the Tech Comm Guide, using the recipient names from the original Challenger Memo in the greeting and names from your team in the signature. Make sure to review and proofread during this step. You do not need to include the drafts in your submission.

- **Evaluate** - Follow the email with a final evaluation denoting why your team believes the revised email achieves the purpose of this communication.

Scenario 2: Now imagine you are writing an email to NASA (your client) to inform them of this. What would you change from the internal team email in Scenario 1 to a client email?

Complete only the Define step of the process to demonstrate and explain the changes your team would make. You do not need to write a second email. Bulleted lists are acceptable formats for definitions. Emphasize differences between the needs of these two audiences (MTI Direct Supervisor vs NASA client).

Creating and submitting the Final Memo:

As a team, you must create a lab memo, as detailed in [Chapter 5.1 of the Tech Comm Guide](#). Make sure the lab memo follows all formatting standards laid out in [Chapter 8 of the Tech Comm Guide](#). The section headers for the document must be:

- Introduction
- Results & Discussion
- Conclusions & Recommendations

Subsection headers under Results & Discussion should be included for each scenario of part 1 and each of the technical writing style & strategies of part 2.

When the memo is complete, make sure to edit for grammar and spelling. After editing is complete, save the document in both .docx and .pdf format. One and only one member from your team should submit the .pdf format of your memo.