GET TO THE POINT!

Quick Tips to Improve Technical Writing

with ideas from ENGINEERED WRITING, M. J. Murray and H. Hay-Roe, Pennwell Books, 2nd Ed, 1986

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How to Begin

- Don’t start writing sentences!
- That puts style before content.
- 80% Content / 20% Style
- Writing is a process, like solving equations

Technical Writing Plan

- Consider the Audience
- Determine the “essential message”
- Outline
- Assemble graphics
- Expand Outline
- Write, edit
Your Audience

• Who are they?
  – Technical peers
  – Management

• What do you want them to do?
  – Management controls assets: equipment, time
  – Your job is to tell them how to allocate assets.

Your Audience

• Is often multilevel, requiring different levels of detail:
  – Summary for management
  – Body for your technical peers
  – Appendix for specialists

• All readers want
  – accurate, complete information
  – presented clearly and concisely
The Essential Message

• Your key finding and the action you want taken.

• Abandon the “suspense format”
  – Put your key finding up front,
  – then provide supporting data.

• This is not fiction; we don’t need to build to a climax. Get to the point!

Contents of the Essential Message

• **What’s** the News?

• **Why** is it important? (briefly)

• **How** did you find out? (briefly)

• **Now what?**
Example of an Essential Message

A 5% yield increase on all current products can be attained by plasma cleaning prior to wire bonding. These results were obtained on comparative sample lots fabricated in the R&D lab. Engineering recommends the expenditure of $10,000 to add plasma cleaning to one production line for evaluation.

- What’s the News?
- Why is it important?
- How did you find out?
- Now what? 3 @ 15 w/s

OUTLINING FOR STRUCTURE

THE SINGLE MOST IMPORTANT STEP IN WRITING

- Beginning: The essential message.
- Middle Details of what you did.
- End: Restate conclusions,
       Make recommendations.
THE MIDDLE, OR BODY

• What you did and how you did it
  – In logical groups (not always chronological)
  – Were there any dead ends?
  – Remember that science must be repeatable

• Quantify the results graphically.

ASSEMBLE GRAPHICS

• Graphs, block diagrams, photos

• Your audience will look at the pictures first

• This may be all that they “read”

• Tell the whole story with the pictures and captions (interpret the data).
END STRUCTURE

• What do the results mean?

• Data must support your conclusions.
  – Alternate interpretations?
  – Are there any “holes”? Additional work needed?

• What do you want your audience to do?
  – Take action
  – Change opinion

INCREASE DETAIL, THEN WRITE

• Expand outline with increasing detail.
  – 3 or 4 levels will create a logical structure.

• Now write sentences!

• Every paragraph should have a topic sentence. Go from general to specific.
ALL WRITING NEEDS STRUCTURE

• Short:
  – lack of structure often obscures intent
  – Put the essential message up front.

• Longer
  – format is often given (thesis, technical journal)
  – often includes abstract or executive summary

STYLE

• Write the way you talk; don’t get wordy.

• Use active voice whenever possible.

• Vary sentence length

• Use tense (past/present) appropriately.
Example 1

“ Adequate statistical samples of parts fabricated immediately before and after the change in process temperature were gathered for a comparison of yield loss and electrical impedance.”

• **passive voice** "samples ... were gathered"

• One sentence, 26 words

• Objective is stated last (after justifying test methods)

Example 2

“We performed a test to determine the optimum process temperature for high yield and low electrical impedance. Increasing the temperature 10°C produced a 5% higher yield than the current process. Differences in impedance were negligible.”

• **Put the important things first:**
  - Action
  - Objective with measurable criteria
  - Results oriented
Example 2 (continued)

• Active voice: “we performed a test”

• Vary sentence length
  – 3 sentences, 35 words
  – 5-17 words per sentence
  – short sentences state the important facts

• Conversational style

• Confusing details go in a data table.

Example 3: verb tenses

“Einstein demonstrated that matter and energy are interchangeable.”

Past tense to describe previous actions.

Present tense for facts which will always be true.
SUMMARY

• Content & structure are more important than style.

• Start with an outline
  – Put the essential message first
    • What’s the News, what’s in it for them
  – Tell why and how you found out.
  – Tell the audience what to do.

• Write in a conversational style

About the Author

Robert B. Wiggins is President of Quartzdyne, Inc., the world’s leading manufacturer of precision pressure sensors for oil-and-gas exploration and production.

Mr. Wiggins received two bachelor’s degrees from the University of Utah. In 1972, he received a BA in English, after which he taught school and served in the US Army. He returned to the U, earning a BS in Mechanical Engineering in 1980.

Since 1981, Bob has been developing quartz-resonator sensors at Quartzdyne, as a Design Engineer, Project Manager, and Vice President of Engineering and Marketing. He became President of Quartzdyne in July 1999.

Bob holds five patents for quartz-resonator sensors for measuring pressure, temperature, and weight. He is the co-author of more than 15 technical articles on quartz-resonator sensors. Mr. Wiggins is a Senior Member of the Institute of Electrical and Electronic Engineers, a Member of the American Society of Mechanical Engineers, and a Member of the Society of Petroleum Engineers. He serves on the University of Utah College of Engineering’s National Advisory Council.

Quartzdyne specializes in accurate, high-resolution, low-drift measurement of pressure to 30,000 psi, at temperatures to 400°F, in high shock and vibration environments. Quartzdyne is based in Salt Lake City; its primary markets are oilfield service companies and oilfield tool builders in Great Britain, France, Alberta, Canada, and Houston, Texas. Dover Corporation acquired Quartzdyne in January 1998.