

Designing Written Reports

Adapted from a presentation by
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3/22/2016

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Overview of Topics

- 1) Purpose and audience for PDR proposal and CDR report
- 2) Structures contain some elements of both *reports* and *proposals* (PDRs, CDRs)
- 3) Parts of the formal proposal document
- 4) “Best Paper” competition



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In Senior Design, you wear two different hats: as engineer and as writer-presenter

- To perform your professional **engineering** duties requires one mindset
- To **communicate** your results to others requires a different mindset



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Think about your purposes for proposals and reports

- **Why are you writing or presenting this information?**
 - Demonstrate your oral and written communication skills (ABET)
 - Demonstrate engineering solutions to clients (Workplace)
 - Demonstrate competence to managers (and instructors)



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Analyze the multiple audiences for Senior Design proposal and report

- **Who is in your audience?**
 - Your client (#1)
 - Tech advisors
 - Project manager
 - In job setting, would review prior to presenting to client
 - Other faculty and students
- Create an audience analysis chart to keep all in mind

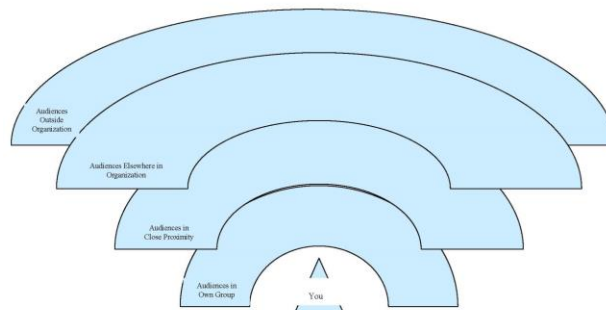


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Audience analysis chart

Maths & Stevenson, *Designing Technical Reports* – adaptation of egocentric audience chart



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The communication purpose algorithm

Algorithm

- (Fact A) We made a decision based upon an estimate given to us by the contractor. However, (Fact B), the contractor has now given us a revised estimate which is 600% over the original, and we are still expected to pay the bill.
- We did X.
- In this document, we report/propose X.

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Review the requirements for proposing a project in Preliminary Design Review (PDR)

- Contains some elements of persuasion, but first must demonstrate engineering competence objectively
 - On the job, you would have competitors for the contract
- Presents the **problem** clearly (A but B algorithm)
 - Confirms your understanding of client's problem, with any constraints or parameters, within contexts
- Presents real **alternatives**, defends choice
 - Feasibility and merit criteria related to *problem*, not just to *technical* possibilities
- Gives timetable, resources, ways to measure success
- Asks for permission to build and test

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Remember the basic structure for any proposal, as taught in TCO 341:

- Summary (abstract, executive summary are different—you produce executive summary)
- Introduction
- Proposed Activities
- Qualifications and Experience
- Budget
- Appendices

Let's review each part quickly.

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Parts of a PDR proposal

- ***Introduction***—the subject, problem definition, purpose, any background needed, scope, forecast of the report's structure and conclusions
- ***Project Description***—how you propose to solve the client's problem
 - What will define success in solving this problem? (no single solution yet)

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...Parts of a PDR proposal

- **Feasibility criteria** —constraints of any solution
 - Yes/no, possible/not possible
- **Merit criteria** —desirability of possible solutions
 - Measures used to judge relative success of options
 - Weighted for sensitivity, importance
- **Work accomplished** — show your engineering credibility with documentation
 - Merit analysis
 - Engineering sketches, drawings, discussion, engineering analysis to predict performance of preliminary designs

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...Parts of a PDR proposal

- **Conclusions**
 - Select and defend the best design alternative
 - Present budget of projected prototype costs
- **Recommendations**
 - Your proposal to implement the plan to build and test—detailed drawings, descriptions
 - The timeline to accomplish these tasks
 - Request for permission to proceed
- **References, bibliography**—give credit due, build credibility for your research

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...Parts of a PDR proposal

- Appendixes and annexes (attachments)
 - Any supporting or additional materials not essential to the main body of the report, but useful to some readers
 - Calculations, working drawings, extended analyses, lists, photos, etc.
- Résumés of the team, targeting competence to solve the problem
 - Professionally focused, not “student” focus

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...Parts of a PDR proposal

- Front matter—complete this part last—but allow plenty of time to perfect it!
 - Title page
 - Executive summary
 - Acknowledgments (thanks to those who assisted— optional, but courteous to do)
 - Table of contents with page numbers
 - List of figures, tables, symbols, illustrations
 - Glossary if needed

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Differences in writing your report for Critical Design Reviews

- Not just a repeat of the PDR *proposal*, but a *report* on results
 - Very *brief* review of problem, choice of solution—recap what was agreed upon in PDR
- Strong emphasis on what you did, why, and with what results [but not story-like!]
 - Chronology of actions, especially any changes
 - Document change requests, explain any problems
 - Explanation of test results (tests related to feasibility and merit criteria)
 - Request approval (in real world, \$\$\$\$)

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...Differences in writing your report for CDR

- **Change in Project Goal for CDR:** focus on what has resulted from your design, construction, and testing; degree of success you achieved
- **Changes in Recommendations for CDR:** discuss any future actions as prototype enters production; ask for approval of the completed design

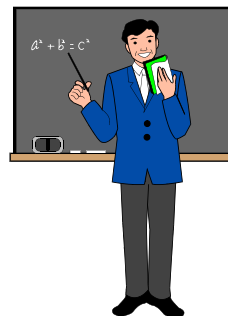
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For PDR & CDR: Important to demonstrate both *engineering* and *communication* skills

Assemble professionally designed PDR and CDR documents

- Use good descriptive headings, dividers
- Edit carefully; get peer reviews
- Design an effective presentation format
- Be sure your **writer's** tasks are done as well as your **engineer's** tasks



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Finally ...

- “Best Paper” Competition

Honor awarded to best CDR paper of the year (since 2002-2003), presented at Honors Day Convocation

- Nominated by EGR faculty (usually 5-10 teams)
- Evaluated by TCO and STC judges
- Sponsored by Mercer Chapter STC & TCO Dept.
- Perpetual plaque with team names on display in MUSE

- Criteria for Evaluation:
 1. Clarity of technical information
 2. Document design, including integrated visuals
 3. Skill in writing (organization, voice, grammar)

- Reminders:

- Management review meetings (with me) AND individual project reports (by email) this Thursday
- Journal/Patent Summaries are due NEXT Tuesday (March 1)

Questions?

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