The Engineering Presentation—Some Ideas on How to Approach and Present It

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Abstract—Achieving a successful presentation begins with the consideration of three things: what to say, how to say it, and how to conduct the presentation to convince an audience that you mean it. Determining what materials, topics, and details to use must be based on an analysis of the potential audience, their sentiments, interests, technical disciplines, and possible responses to what would be presented. Presentation material must be put into a unified, professional, and easily understandable format and thoroughly rehearsed so that it can be delivered in a manner that instills confidence that the subject has been well-researched. The author presents some strategy, guidelines, and pitfalls, based on experience, for consideration toward these ends.

MOST of the time we are given only one chance to present our ideas., If this is not done effectively at that time. the success of any future communication on the same subject could be jeopardized or, even worse, willingness of the audience to ever listen again to a particular speaker who "came across" as ill-prepared, boring. or incompetent could be destroyed.

For communication between speaker and audience to be successful, it must be the culmination of a preparation process started long before, one which included a carefully thought-out "speaker–audience interaction scenario." Such a scenario hypothesizes the type of audience expected, their sentiments, prejudices regarding the subject, orientations (political beliefs or group structure, for example), technical disciplines, personal interests, and questions that might be raised.

Based on the results of this audience analysis, you can determine **what** and **how much** must be said to satisfy both your and the audience's needs. When this is accomplished, organize the information into a suitable format and take it through as many full-scale dress rehearsals or dry-run presentations as necessary to become confident of convincing the audience that you know what you are talking about. To help achieve these goals, some guidelines, pitfalls, and ideas on strategy, based on experience, are presented.

PREPARING THE PRESENTATION

Determining What to Say

I. Thoroughly research what the presentation is to cover, from a general and a contractual viewpoint. Know what

your audience **has** to see and hear and what information they **would like** to receive.

2. In researching your contractual documents, **extract all of the categories you are obliged to cover.** You may be surprised at some of the items at a subtler level that are specified in an applicable military specification. For example, in preparing an aircraft avionics presentation. 1 compiled material on the major and **commonly** thought-of topics such as displays, signal acquisition techniques, and processing capability but was surprised to find that I also had to address such topics as fungus control and acoustic noise limitations.

3. **Cover all areas,** even if very briefly, and specify them on your agenda. It's better to be complete and include them than to be criticized later for their omission. Your audience may know of the topic, however obscure, but generally they will not know what they are supposed to evaluate or question you on. They will depend on you for that information. If you cover it with details **you** feel are satisfactory, the chances are that no one will want any more.

4. After formulating ideas as to what is expected and what must be covered, contact representatives of your potential audience for further information and confirmation of your own ideas and plans. Again, find out what **they expect** to see and hear and what they would **like** to hear. You can readily gain the appreciation of your audience if you "just happen" to talk about an area they are interested in, or one they may have to cover in a future presentation of their own.

5. **Research your audience's past correspondence** on the subjects you will be covering and be knowledgeable enough to discuss them in depth. Understand their reasons for generating such correspondence so that you will be able to direct any discussion that may arise.

6. It is very important that your presentation **answer your audience's specific questions and concerns.** If possible, gear the material and language of the presentation in that direction. Have viewgraphs presenting **data** that address their specific questions. Try to think about other questions your presentation may raise, and be prepared to answer them.

7. **Thoroughly research all current and past problem areas.** Don't let your audience be first to introduce you to them. Get the latest and complete story on any problem. If it

involves hardware, go to the manufacturer for first-hand information on the nature of the problem and on what is being done to correct it. Maybe even include a discussion of those items in your presentation. In this case, however, ensure that for every problem you have either a solution or a direction you will take toward its resolution.

Putting the Information in Presentable Form

At this point in the preparation, even the most well-versed person, with a wealth of information to present, has, at times, fallen flat on his or her face!

1. At the outset, generate a detailed fact sheet covering the subject of the presentation. For example, if a work status is to be presented, outline all efforts to date; if it is a design concept, list design requirements, assumptions, trade-offs, and rationales. Review your material for correctness, clarity, and applicability. Next, extract only the highlights of this information to use as viewgraph points, making a separate (general) viewgraph for each subtopic and ensuring that there are no more than six points on each viewgraph.

2. In general, *have two viewgraphs per subject—one* general and one detailed. You may never use the latter, but it could be a lifesaver should the need for more information suddenly arise. The general viewgraph should contain only terse statements of fact to key your memory on what to say. The detailed viewgraph, on the other hand, should be slightly "overstuffed," especially with pertinent backup data that cannot be easily memorized. For example, the design review requirements for a particular Air Force avionic development contract called for the contractor to summarize the overall design requirements together with his concept for each. In this case, the general viewgraph contained a summary of the eight major requirements and was backed up by eight detailed viewgraphs presenting laboratory and analysis data. Although the speaker was quite knowledgeable, he was not ready for the barrage of inquiries with respect to "hard numbers." He was able to recover, however, with the help of one of the detailed viewgraphs he hadn't really planned to present.

3. *Make good quality viewgraphs.* Audiences tend to lose interest in faintly observable, hand-written viewgraphs. This is followed by loss of interest in the presentation itself. Make sure that viewgraphs are typed, all with the same typewriter.

4. *Prepare viewgraphs well in advance.* It is better to redo one or two of them than to not have any completed on time. Even having to do all of the viewgraphs over (as a result of, say, a dry run) would not cost much, especially compared to the business that might be lost by not getting your point across. Remember, *you only get one chance at the final presentation—have everything perfect for that rime.*

5. *Always have an introductory viewgraph* before you get into the main part of your presentation to clearly tell your audience *whar you intend to cover.* Never start off right

into the "meat" of the subject as I saw one person do in an attempt to review changes made to a receiver design. The all-important *reasons for* the changes were lost. together with most of the audience, in an explanation *of the* changes. Close with a viewgraph telling the audience *what you have told them.*

6. *Have at least one dry run with the final presentation material,* and have as many knowledgeable people as possible present to critique it.

Notwithstanding the fact that the value of the dry run has been proven over and over again, I have found from personal experience, and through discussions with others involved in various presentations, that many organizations appear to be lax in this important area. Dry runs are always planned but often, due to lack of time, are cancelled or reduced to only a quick last-minute review. *Dry runs should be mandatory for all presentations.*

7. In the dry run, go through each viewgraph in *exactly the same order and manner you will formally present it.* Don't skip areas because you think they are of lesser importance. What you might think is insignificant or will be easily understood by your audience may be just the area that causes problems. Don't wait until the actual presentation to find out about it.

CONDUCTING THE PRESENTATION

1. The most important thing to remember is that *you must, from the outset, instill in your audience confidence that you know what you are talking about,* that you will be proceeding in the right direction with your work, and that. ultimately, you will give your customer what he or she wants.

This is extremely important, for the degree of success you achieve will manifest itself in the effectiveness and ease with which you are able to conduct your work in the future.

2. *Know your audience.* If your audience will contain a majority of people from a particular area (flight crews, for example), expect many questions and discussions in that area (displays and "knobology," in this example). Be prepared so that you will have to defer only a minimum of questions. The more you answer during the presentation, the fewer action items you will have to worry about later.

3. *Don't dwell on whar may be boring or not universally interesting topics.* People tend to go into unnecessary detail explaining things they are very knowledgeable about. I attended a presentation to the Air Force in which one speaker went into a long and precise technical explanation of an avionic system. His knowledge of the subject was excellent but the details he presented were unnecessary. When he finished, a number of Air Force personnel gave him a standing ovation, partly because of his expertise. but mainly because he finally finished! *Avoid this pitfall.*

4. Don't engage in arguments or any other confrontation with your audience. Stay calm and unflustered — postpone (if necessary) touchy discussions to splinter groups.

This advice may sound unnecessary but I was, unfortunately, witness to such a confrontation during an initial engineering design presentation, where the thrust was really to establish the confidence I spoke of earlier. Needless to say. it did not help us toward that goal; nor did it help the people scheduled to speak next.

5. Speak loudly and actively throughout the presentation. Too many people start loud only to become inaudible either toward the end of the talk or toward the end of each sentence.

6. Have handouts consisting of at least a topic outline of your presentation if not a copy of your entire set of viewgraphs. Handouts of data are also desirable.

7. Have enough handouts. Make sure that there are enough to go around. I knew one individual who was insulted and subsequently appeared hardened to the presentation because he didn't receive a copy of the handout. Such a person may be rare but sometimes this may be the voice that counts.

8. Never allow your presentation to be a reading of your viewgraphs. A person who does this only proves two things: that he or she can read and that he or she is the wrong person to give the presentation.

9. Always maintain a "lecturer" stature during your presentation. You should strive to maintain a speaker–listener relationship with your audience in which **you** are the one giving the information for their review. Do not fall prey to a barrage of questions that puts you on the defensive. This will destroy your presentation and violate item 1. Once you lose the speaker or lecturer role, it is difficult to fully regain.

A FINAL COMMENT

After all is said and done, remember that your audience is human, also. They are just as anxious to learn about the subject you are presenting as you are to teach them. The easier you make it for them, the easier your task will be, and the more favorable an impression you will make. Always try to **put yourself in their place,** both when you prepare and when you deliver your presentation.