PROPER DESIGN OF PRESENTATION DOCUMENTS

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Introduction

I have recently noticed a significant amount of ineffective presentation documents. We will discuss how to improve this.

Agenda

1. Discuss the important elements of design in presentation documents
2. Critique the slides ““Orbiter Assessment of STS-107 ET Bipod Insulation Ramp Impact”
3. Show some improved slides

DESIGN ELEMENTS

Clarity

- Make sure to explain all technical jargon and acronyms
- Avoid the use of too many pronouns
    - It can rapidly become confusing when too many pronouns are used
- Limit the use of bullet hierarchies and different fonts

Usability

- Design your document with audience in mind
    - Do they have the technical background to understand?
    - Are you presenting a clear conclusion?
- All charts and graphs should be easy to understand and present clear trends or conclusions.
- Make sure all conclusions and summaries are clearly labelled

Accuracy

- Make sure all information being shared is correct
  - Look out for incorrect summaries or conclusions
- Pay attention to your wording so there's no misunderstandings or implied work that you did not intend.
- Make sure all axes of graphs are labelled and accurate.
- Keep track of your units and try to keep the same notation throughout your document.

Example Slide 1

This title implies the "Crater" program shows signification damage and that is important but the body implies this data is unreliable. Which is it?

How bad would this result be? Is this a catastrophic failure?

Damage Results From "Crater" Equations Show Significant Tile Damage

How conservative are we being? Can we not trust this analysis?

- **"Crater" indicates that multiple tiles would be taken down to densified layer**
  - **However, program was designed to be conservative due to large number of unknowns**
  - **Crater reports damage for test conditions that show no damage**

Tile Information		Location			Impactor		Calculated Damage		
Type	Thickness	Letter	X	Y	Angle	Velocity	Depth	Length	Width
9 lb	2.6 - 2.8	A	1060	190	13	720	4.7	25.8	7.2
22 lb	2.6 - 2.8	A	1060	190	13	720	3.2	25.8	7.2
9 lb	2.3 - 2.4	B	1090	180	6	700	2.8	31.9	7.2
9 lb	2.0 - 2.4	C	1036	150	8	680	3.3	29.8	7.2
22 lb	2.0 - 2.4	C	1036	150	8	680	2.3	28.6	7.2
9 lb	1.9 - 2.0	D	1075	150	8	710	3.4	32.2	7.2
12 lb	2.8 -3.1	E	1029	177	10	680	2.9	19.0	2.4
22 lb	2.8 -3.1	E	1029	177	10	680	2.6	19.0	2.4
9 lb	1.7	F	1184	182	6	730	2.8	32.8	2.4

Damage data and tile thickne[illegible]re given in inches.

What does this image show? Catastrophic failure? Repair needed

Debris Size = 20" x 16" x 6"

(Density = 2.4 lb/ft^3)

This column is a reference to an image shown 2 slides before. This should be explained in the caption for the chart

Example Slide 2

The title indicates that the results are conservative, but the last line states thatt the condition is outside any test databases. That does not imply a conservative result.

Review of Test Data Indicates Conservatism for Tile Penetration

There are far too many levels of bullet points

Each "Hierarchy" of bullet having its own font makes it hard to tell what is most important. There's no differentiation and just a lot of text

- **The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data**
  - **Crater overpredicted penetration of tile coating significantly**
    - **Initial penetration to described by normal velocity**
      - Varies with volume/mass of projectile (e.g., 200ft/sec for 3cu. In)
    - **Significant energy is required for the softer SOFI particle to penetrate the relatively hard tile coating**
      - Test results do show that it is possible at sufficient mass and velocity
    - **Conversely, once tile is penetrated SOFI can cause significant damage**
      - Minor variations in total energy (above penetration level) can cause significant tile damage
  - **Flight condition is significantly outside of test database**
    - **Volume of ramp is 1920cu in vs 3 cu in for test**

This line isn't clear. What is it trying to say?

It is important to keep conventions the same throughout. Earlier they showed cu in as cu. In and earlier in this line there is no space between 1029 and cu in. This just looks sloppy

Damage Results From "Crater" Equations Show Significant Tile Damage

- "Crater" indicates that multiple tiles would be taken down to densified layer, a potential catastrophic condition
  - However, if we run through past test conditions that showed no damage, "Crater" will report expected damage
  - Since we are looking at a situation with a large number of unknowns, we want to keep these examinations conservative

Tile Information		Location			Impactor		Calculated Damage		
Type	Thickness	Letter	X	Y	Angle	Velocity	Depth	Length	Width
9 lb	2.6 - 2.8	A	1060	190	13	720	4.7	25.8	7.2
22 lb	2.6 - 2.8	A	1060	190	13	720	3.2	25.8	7.2
9 lb	2.3 - 2.4	B	1090	180	6	700	2.8	31.9	7.2
9 lb	2.0 - 2.4	C	1036	150	8	680	3.3	29.8	7.2
22 lb	2.0 - 2.4	C	1036	150	8	680	2.3	28.6	7.2
9 lb	1.9 - 2.0	D	1075	150	8	710	3.4	32.2	7.2
12 lb	2.8 -3.1	E	1029	177	10	680	2.9	19.0	2.4
22 lb	2.8 -3.1	E	1029	177	10	680	2.6	19.0	2.4
9 lb	1.7	F	1184	182	6	730	2.8	32.8	2.4

Fig 3. Damage data and tile thickness given in inches. Letter refers to Fig 2 on Slide 3
Debris Size = 20" x 16" x 6"; Density = 2.4 lb/ft^3

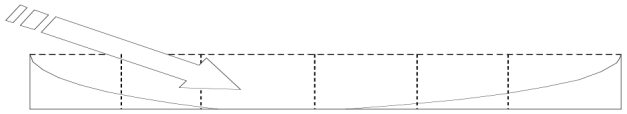

Fig 4. This shows a sample impact angle and the depth of damage done to the tiles.

Review of Test Data Shows Flight Condition Significantly Outside Test Database

The existing SOFI (the material the impactor was made of) on tile test data used to create Crater was reviewed along with STS-87 Southwest Research Data

- Crater over predicted penetration of tile coating in these tests significantly.
  - Initial penetration varies with volume/mass of projectile (e.g., 200 ft/sec for 3 cu in) and is described by normal velocity
- Significant energy is required for the softer SOFI particle to penetrate relatively hard tile coating
  - Test results do show it is possible at sufficient mass and velocity
- Conversely once tile is penetrated SOFI can cause significant damage
  - Minor variations in total energy (above penetration level)can cause significant dam tile damage
- Flight condition is significantly outside of test database
  - Volumet of impactor is 1920 cu in vs 3 cu in for test

Conclusion

- Design in presentation documents is very important and something we desperately need to improve.
- I hope this gives you some insight what to improve and why we need to do so.

Do we have any questions?

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PRESENTATION OUTLINE

Slide 1:

Introduce the topic of design in documents and introduce myself as the engineering manager.

Slide 2:

Discuss how I have recently noticed a significant amount of poorly designed documents. I should stress their importance and mention that they lack clarity, usability, and even are inaccurate at times. Stress that these presentations have been given to colleagues and even customers. Then go on to discuss the agenda.

Slide 3:

Discuss the elements of Clarity and Usability. Stress that it is important to know your audience and to cater all decisions in design to them. Discuss the things that make slides hard to read like too many hierarchies or changing font types. When discussing usability make sure to stress that conclusions need to be clearly laid out in a way that the audience can understand. If presenting something to a non technical manager make sure to layout in clear wording what the real world issues are in a way that they can understand.

Slide 4:

Discuss the importance of accuracy in your documents. On this slide we will want to again stress the importance of speaking to your audience, this time with a focus on not implying anything through your word choice that you didn't intend. It is also important that any visuals you use are properly labelled and show what you want as well.

Slide 5:

This slide has an image of slide #5 from the example slide deck "Orbiter Assessment of STS-107 ET Bipod Insulation Ramp Impact." Several comments are added in red and should be discussed with the group. In particular we want to stress that at the time the group making these slides were unsure of their analysis and wanted images taken of the aircraft. Does this slide imply that they need some help from outside analysis? Would that be clear to someone who wasn't working on this project?

Slide 6:

This slide has an image of slide #5 from the example slide deck "Orbiter Assessment of STS-107 ET Bipod Insulation Ramp Impact." Several comments are added in red and should be discussed with the group. This time make sure to emphasize how wordy the text is and how difficult it is to read. You can't really get a good feel for what this slide is trying to tell you and what the point and purpose of this slide is. The number of bullets and different fonts only makes it more difficult.

Slide 7:

This is the example slide I gave showing an improved slide #5. Point out the major changes, mainly adding the figures captions and a few changes to the wording of the text. Ask the audience if they have any other changes they would make.

Slide 8:

This is the example slide of an improved slide #6. Point out the major changes including changes to the bulleting scheme as well as the change in the title. Also added a description of what SOFI was. Ask if anyone has any other changes they would make.

Slide 9:

Reiterate the importance of design in our documents and ask for any questions.