CornellEngineering

Be Better Than Bullets (redux): A Presentation About Presentations

Traci Nathans-Kelly, Ph.D.

- College of Engineering, Cornell University
- IEEE Professional Communication Society

Today's presenter: Traci Nathans-Kelly, Ph.D., currently teaches full-time at Cornell University in the Engineering Communications Program. As well, she instructs for the University of Wisconsin-Madison in the Engineering Professional Development department, working with the Master of Engineering Management (formerly M E in Professional Practice--MEPP) and Masters of Engineering in Engine Systems (MEES) online graduate programs. This degree accepts practicing professional engineers and technical experts after they have been on the job for five years (some are Boeing employees!). She instructs a variety of topics, including technical communication (graduate and undergraduate), technical presentations (graduate and undergraduate), technical editing, writing user manuals, and other courses. As a member of IEEE's Professional Communication Society, she serves as a series editor for the *Professional Engineering Communication* books and participates at the national level for that organization. She has been active in the Society for Technical Communication (STC) as Senior Member, where she was the Manager for International Technical Communication Special Interest Group, she was a member of the Committee on Global Strategies, and she judged at the international level for the STC Publications contests for scholarly journals, scholarly articles, and information materials.

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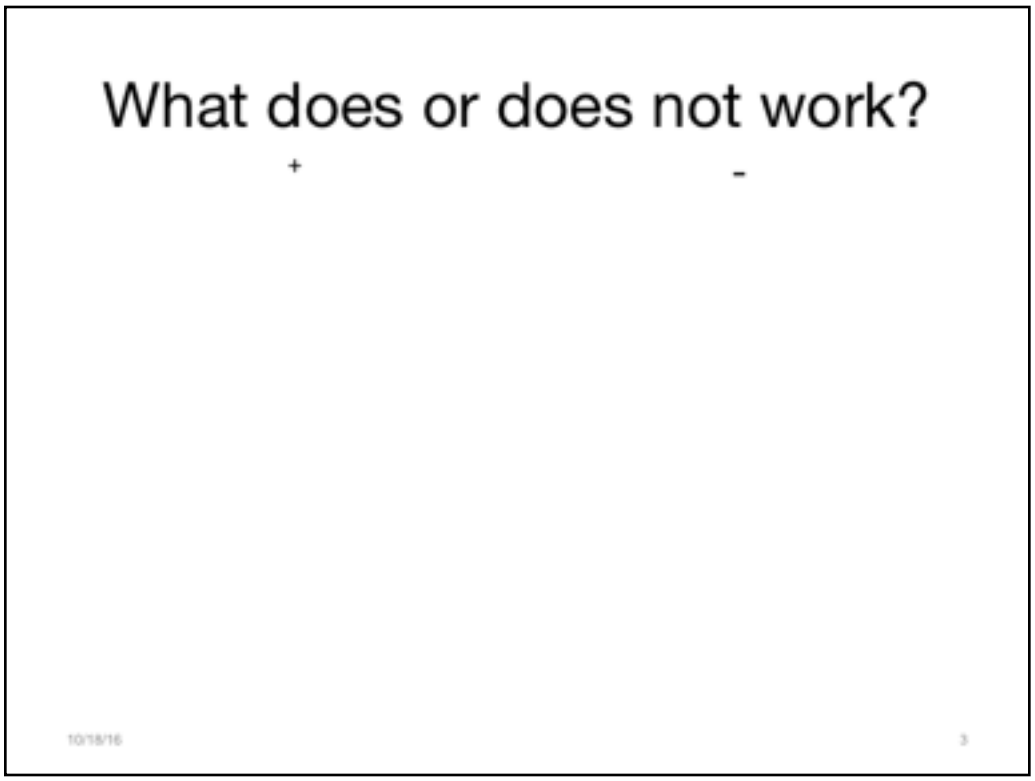
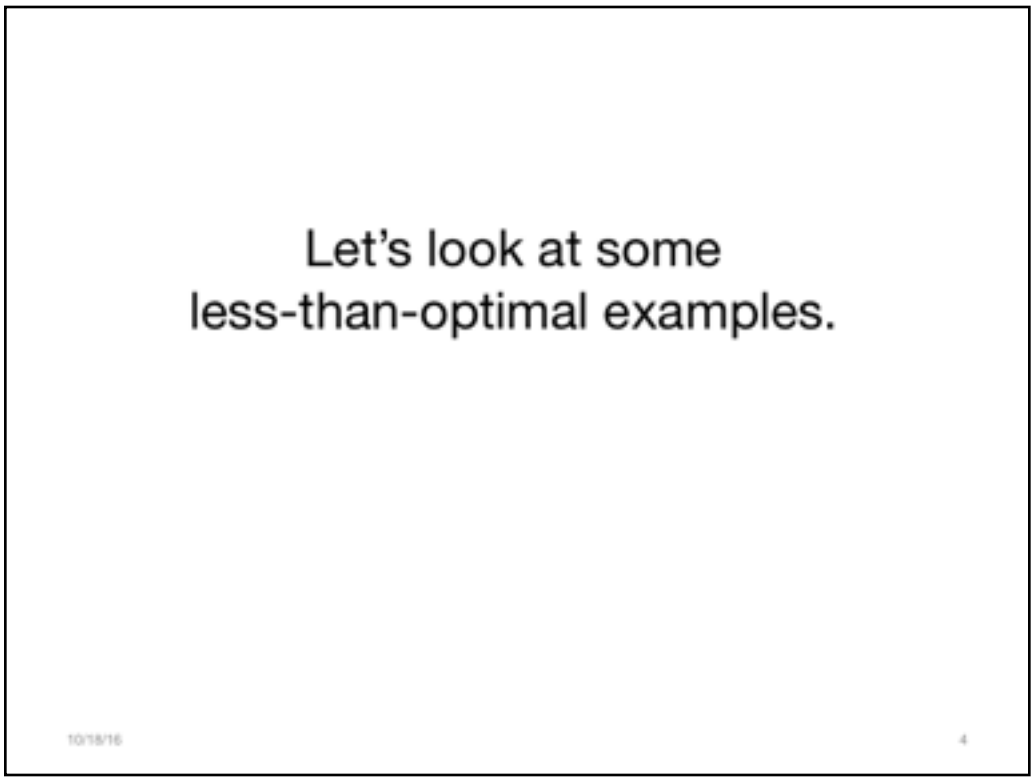
Christine G. Nicometo, M.S., (Traci's colleague and writing partner) has taught technical communication courses for undergraduate and graduate students at the University of Wisconsin–Madison campus since 2003. She instructs for the University of Wisconsin-Madison in the Engineering Professional Development department, working with the Masters of Engineering Management) , the Masters of Engineering in Engine Systems (MEES), and the Masters of Engineering in Sustainable Systems Engineering (SSE) online graduate programs. She received her master's of science degree in Rhetoric and Technical Communication from Michigan Technological University, where she taught technical communication and English as a Second Language (ESL) courses. She also taught ESL courses at Finlandia University where she was the director of a federal, TRIO, Student Support Services grant. Her interests lie in discovering how technology alters the ways we communicate, learn, and teach. She has directed nationally funded K-12 technology workshops and is currently the director of the New Educator's Orientation workshop in the College of Engineering at UW-Madison.

Other email:

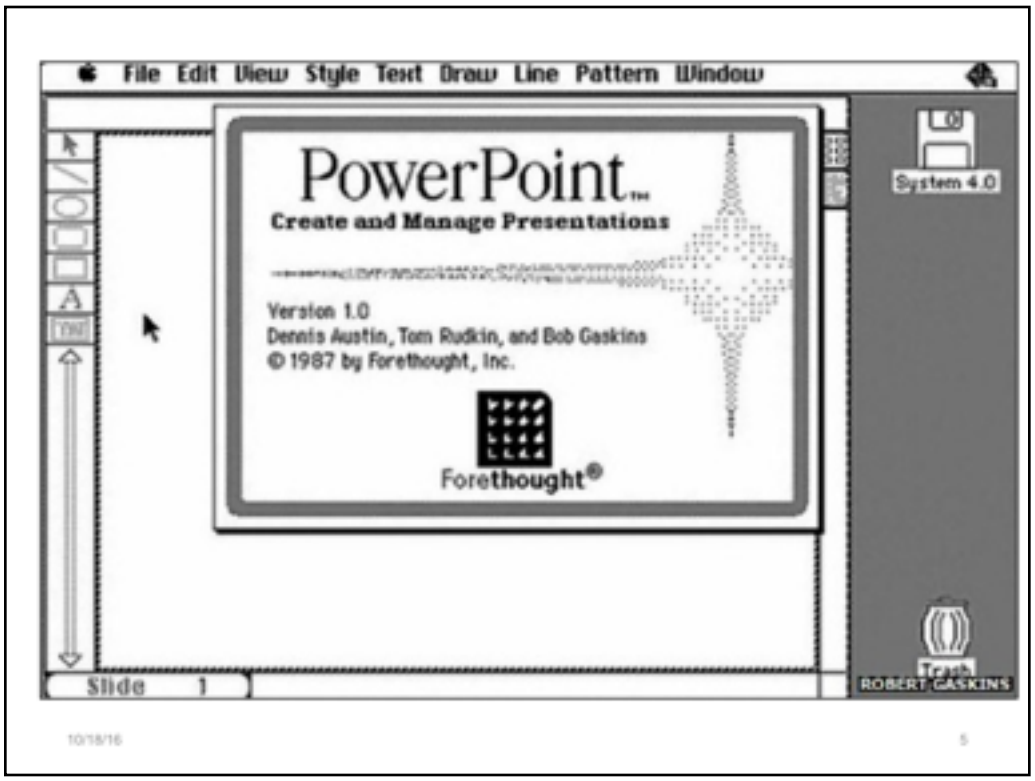
nicometo@epd.engr.wisc.edu



Interactive

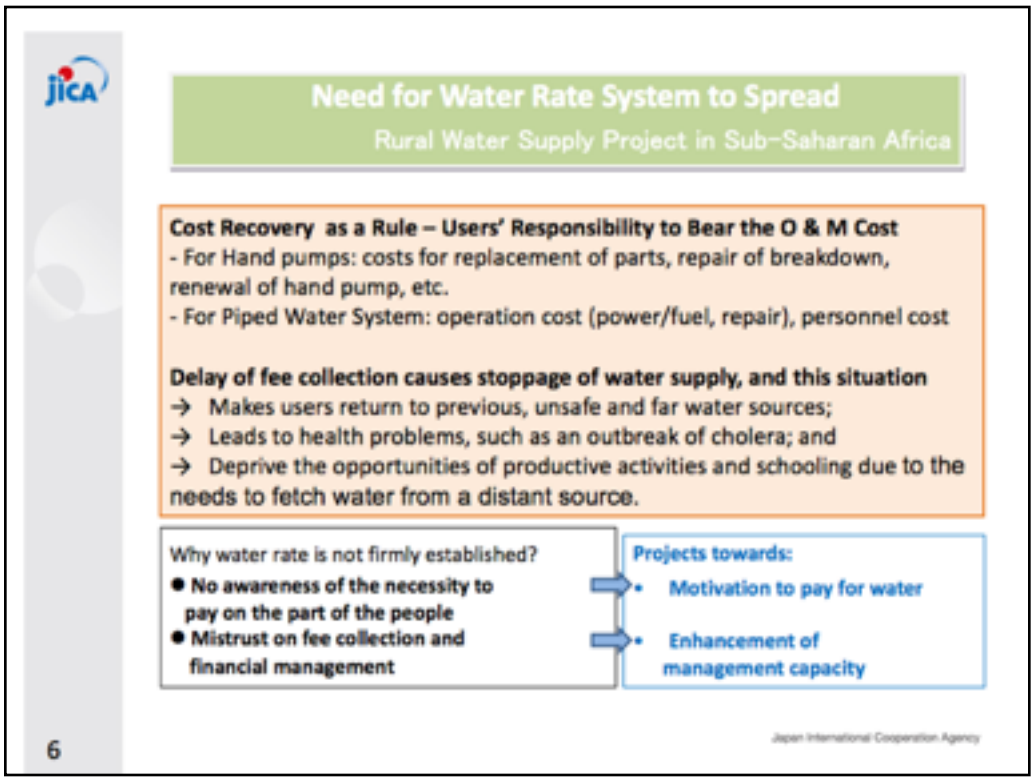


You will see examples herein from a variety of engineering fields.



We need to understand how we got to the messy place, where we are now, with slides. Understanding this short story will help users understand how and why to enact change in their techniques and patterns of use.

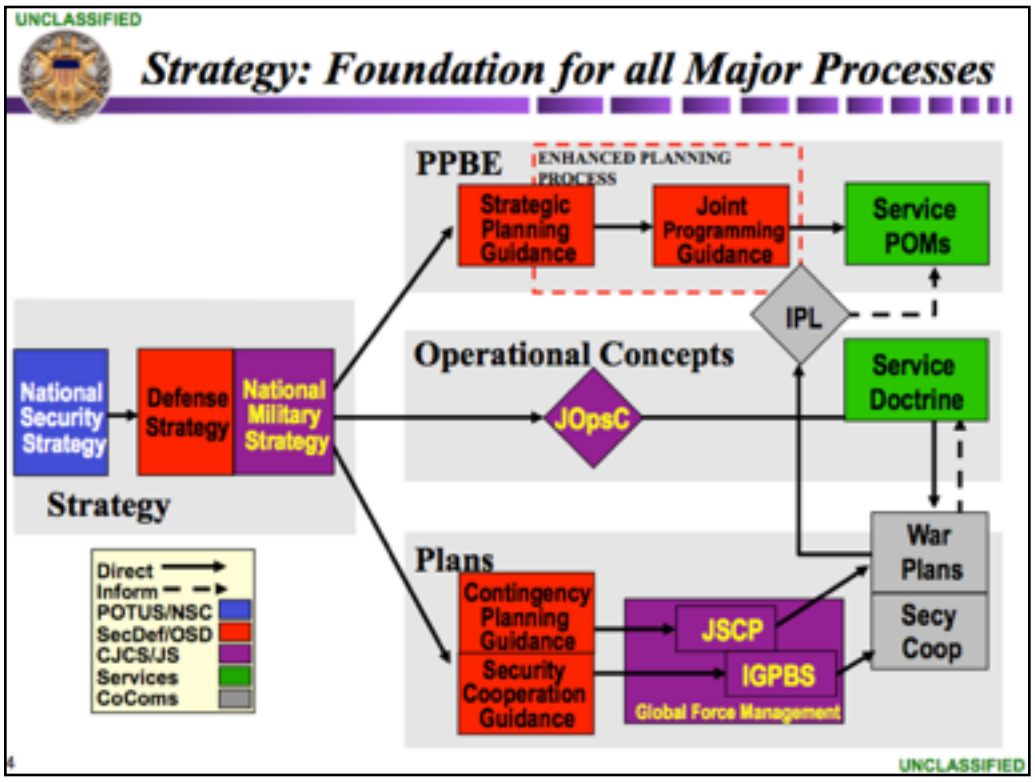
1987: Robert Gaskins markets PowerPoint, which is a rebranded version of a Mac product called Presenter.



We see here a variety of less-than-optimal practices. There' is a fragmented header, too much text, and it's too crowded. While the impulse to share information is nice, this kind of slide doesn't support the speaker well or engage the audience. A slide like this will compel audience members to stare at it, rather than paying attention to the expert speaker in the room. This is undesirable.

Source: JICA

Operation and Maintenance
of Rural Water Supply Facilities
in Sub-Saharan Africa



When folks are tired of bullets, they make overly complicated graphics. Again, the gesture was in the right spirit, but the slide tool was not being put to its best purpose.

And while visuals came into play, people forgot to layer them in. So when something like this appeared on the screen, the audience tunes out the speaker and begins to concentrate on figuring out the complex picture. When a complicated visual is used, the speaker may as just leave the room because nobody is listening.

Slide source:

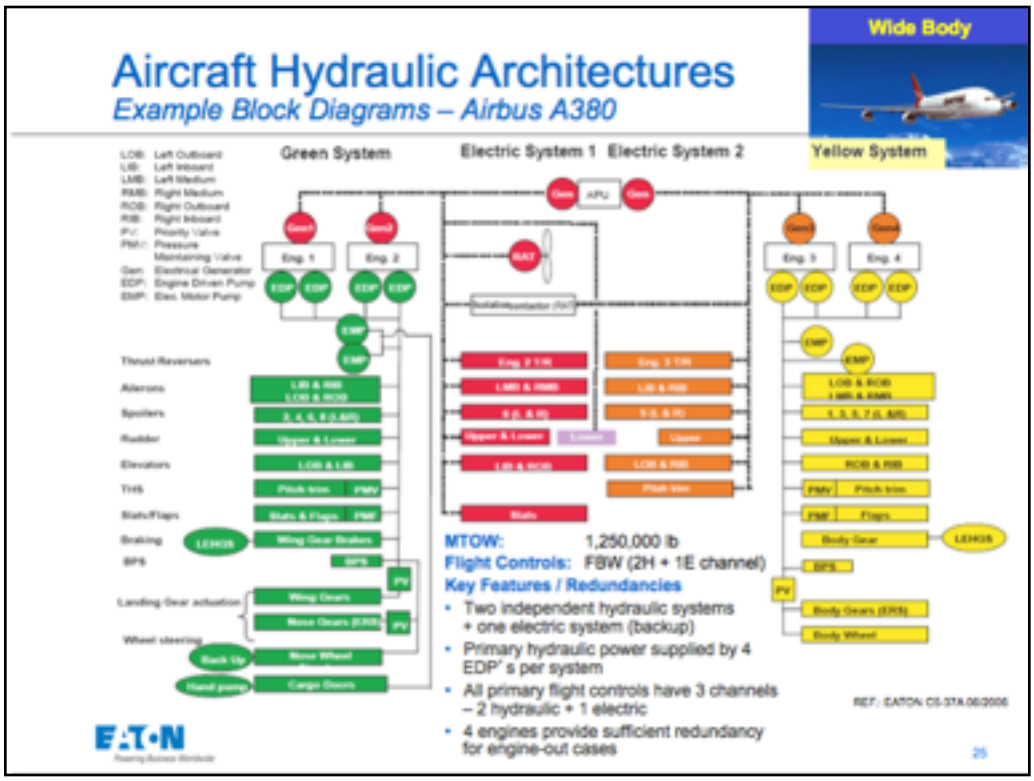
National Military Strategy Precision Strike Association Winter Roundtable, January 26, 2005

CAPT Jeff Hesterman

Chief, Strategy Division

Deputy Director, Strategy and Policy

Joint Staff



…and more pictures that are just too complex for a talk OR for being on a large screen.

Slide source:

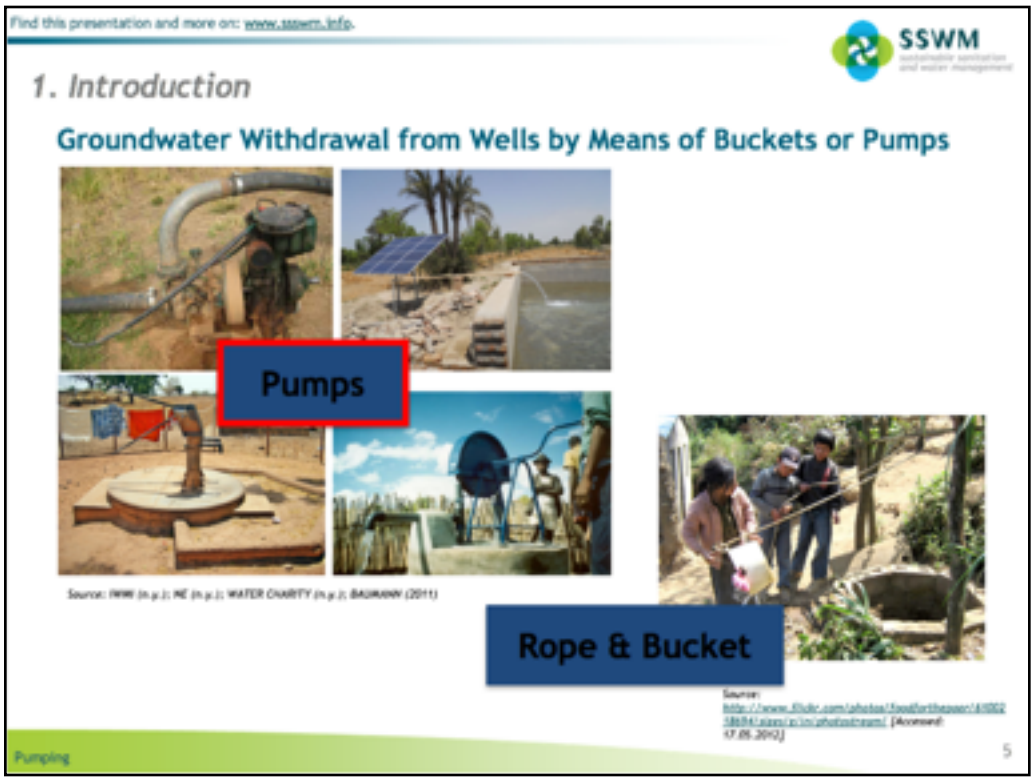
Aircraft Hydraulic System Design

Peter A. Stricker, PE

Product Sales Manager

Eaton Aerospace Hydraulic Systems Division

Aug 2010



Again, there are some poor practices here, but a few things are starting to go right.

Poor:

Fragment header

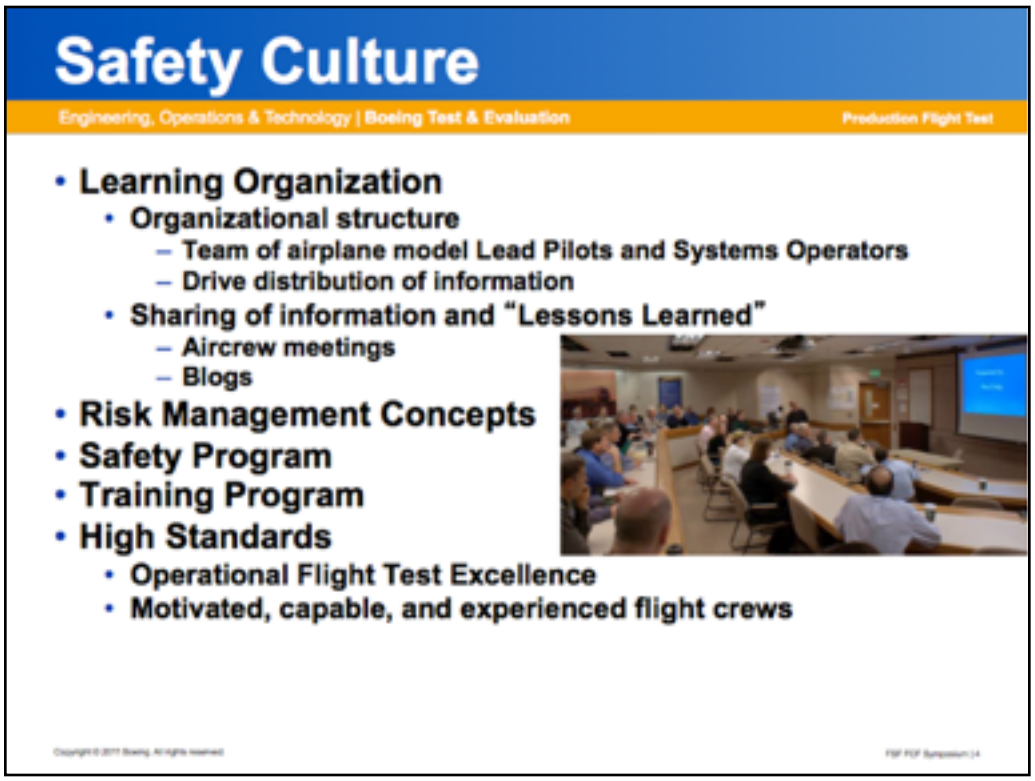
Poor contrast on the word boxes

Better:

Pictures!

Credit for pictures (which later I will show you can go in the notes to clean up the slide)

Source of previous slide



Now, slides like this one, too, just like the others, have a generous spirit behind them. The impulse here is to provide all of the information on the slide, as the presenter has the idea that everyone will "need all of this information." There is no argument there—they probably DO need all of the information. However, slides like this miss their purpose because they are both poor help during the talk and severely lacking as archival material after the fact. Indeed, the impulse to share is a good one, but it can be done much better for technical talks.

Slide Source: **Boeing's Perspective on FCF Risk Mitigation**. Captain Gary Meiser, Chief Pilot, Production Flight Test, Boeing Test and Evaluation. *Presentation to the Flight Safety Foundation, Functional Check Flight Symposium, Vancouver, BC, 8-9 February, 2011.*

Poor practices come from the templates themselves! Just look at the screenshot from this very same slide deck that I'm using now.

This is almost every template you will ever see. It encourages short headings and bulleted text.

And what does that do to presenters?

It makes them create slides like this.

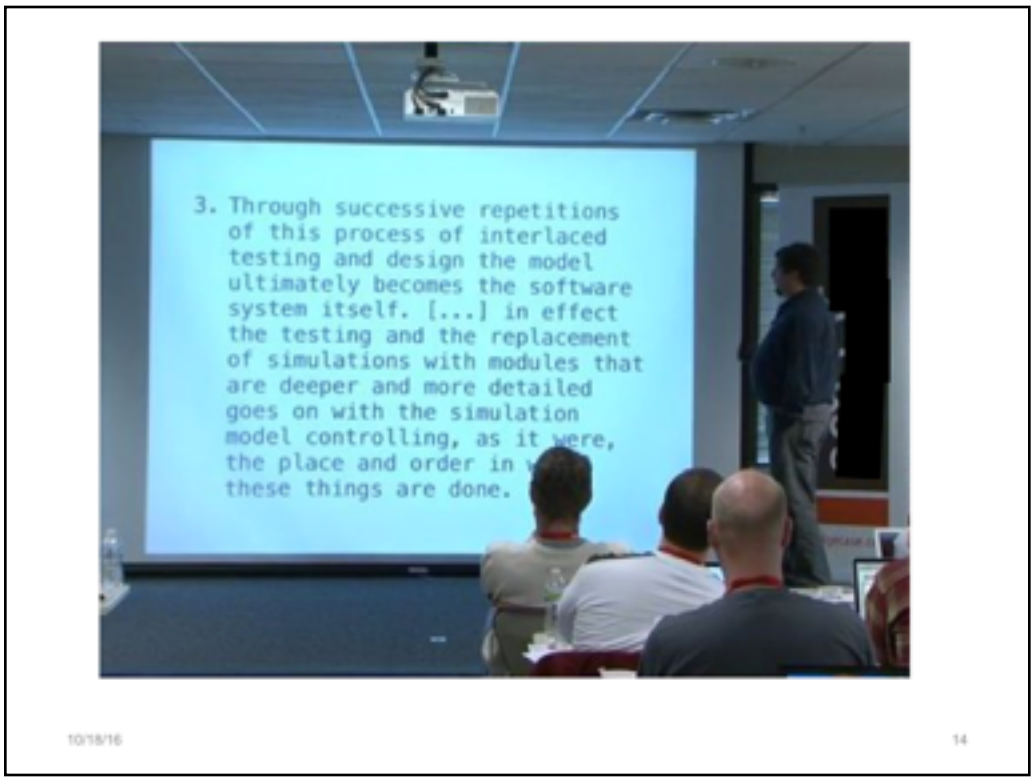
The need to share is generous, but the execution is faulty.

Slide source:

Threat and Error Management for Business Aviation. Flight Safety Foundation

CAC Workshop Oct. 17, 2007

Durwood Heinrich, Ph.D.



As sad as it is to say, everything you see here is precisely wrong about presentations.

1.too much text

2.the speaker is reading it

3.the speaker is not facing the audience

4.it is dark

5.the slide is a glowing monolith…an attention hog

10/18/16 15

We have become a culture where technical presentation slides are nothing more than teleprompters…and that needs to change. We want the EXPERT in the room, talking to the audience authentically.

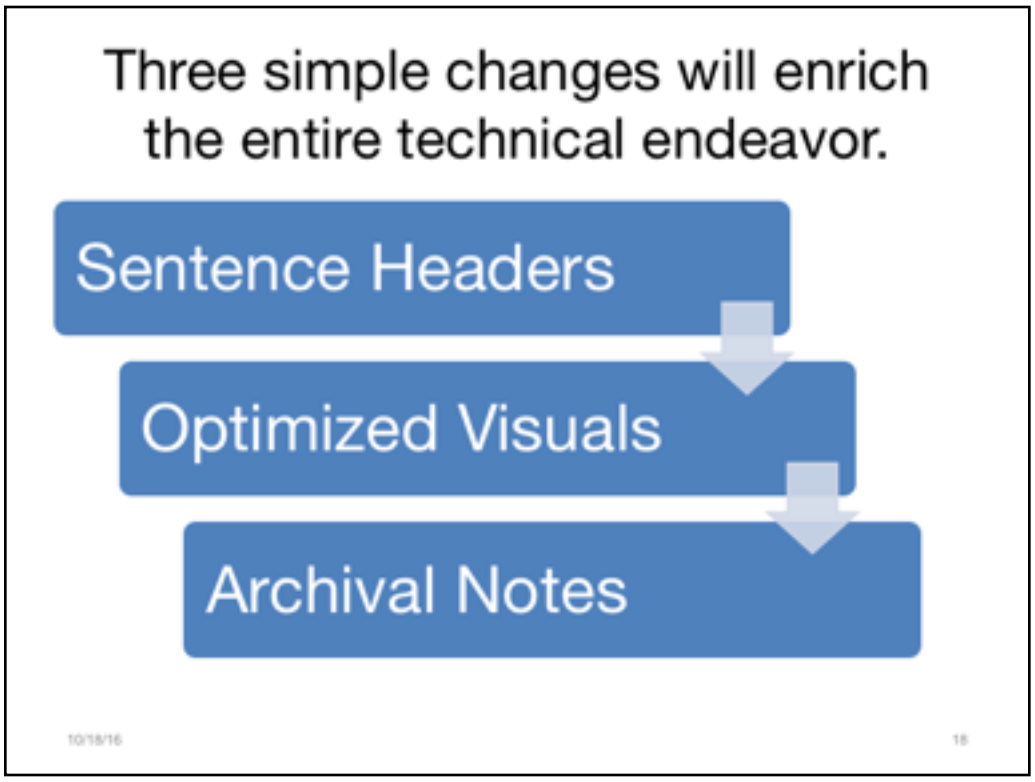
Speakers should reconsider the slides as a tool, using them more like JumboTrons.

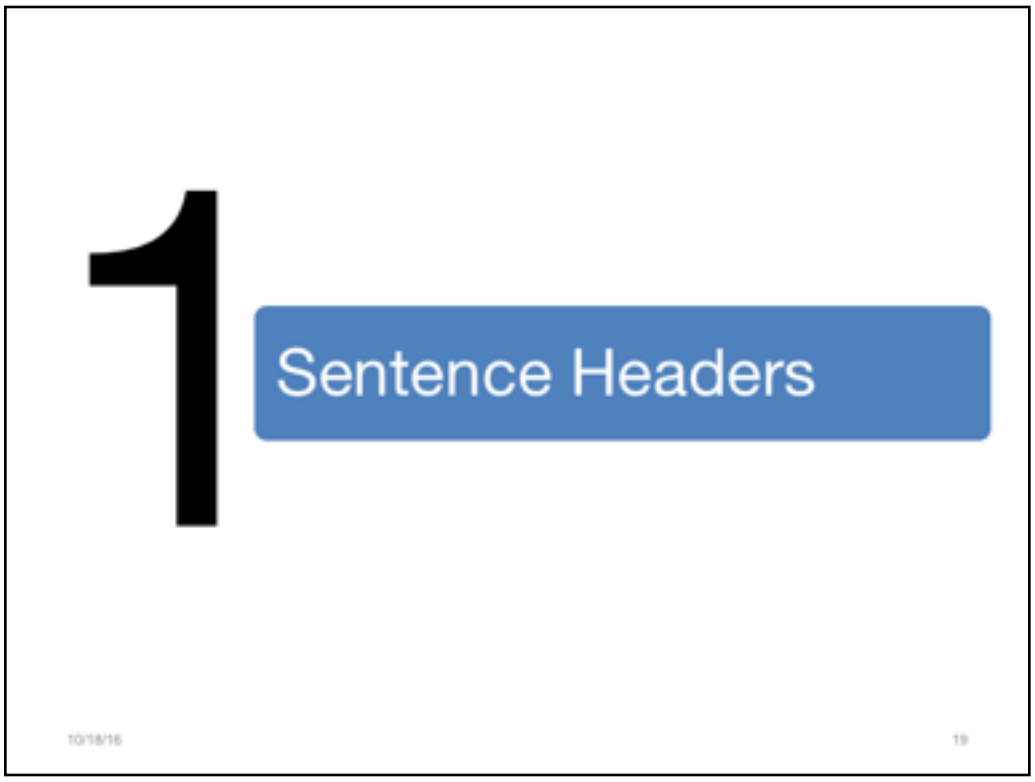
Our mistake comes when we forget that slides are meant to be, during the live talk, more of a JumboTron than a telemprompter.

Photo credit: Ken Beldon. Used with permission.

Slide decks have two lives, and the slide files should support both of those efforts simultaneously. As such, the slide deck becomes an efficient, elegant, rich technical document that has longevity and vitality within organizations.

Today, we are going to begin the conversation about how to accomplish those seemingly at-odds objectives so that your work, housed in slides, carries the technical weight and purpose that it is meant to carry.


Three simple changes will enrich the entire technical endeavor.
Sentence Headers
Optimized Visuals
Archival Notes
10/18/16
18


1
Sentence Headers
10/18/16
19

The old ways don't work for anyone.

Traditional model

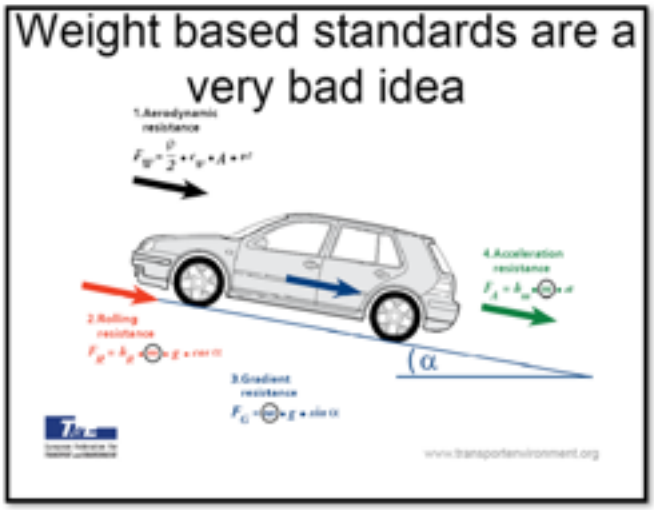
=

Remember that list we created at the start?

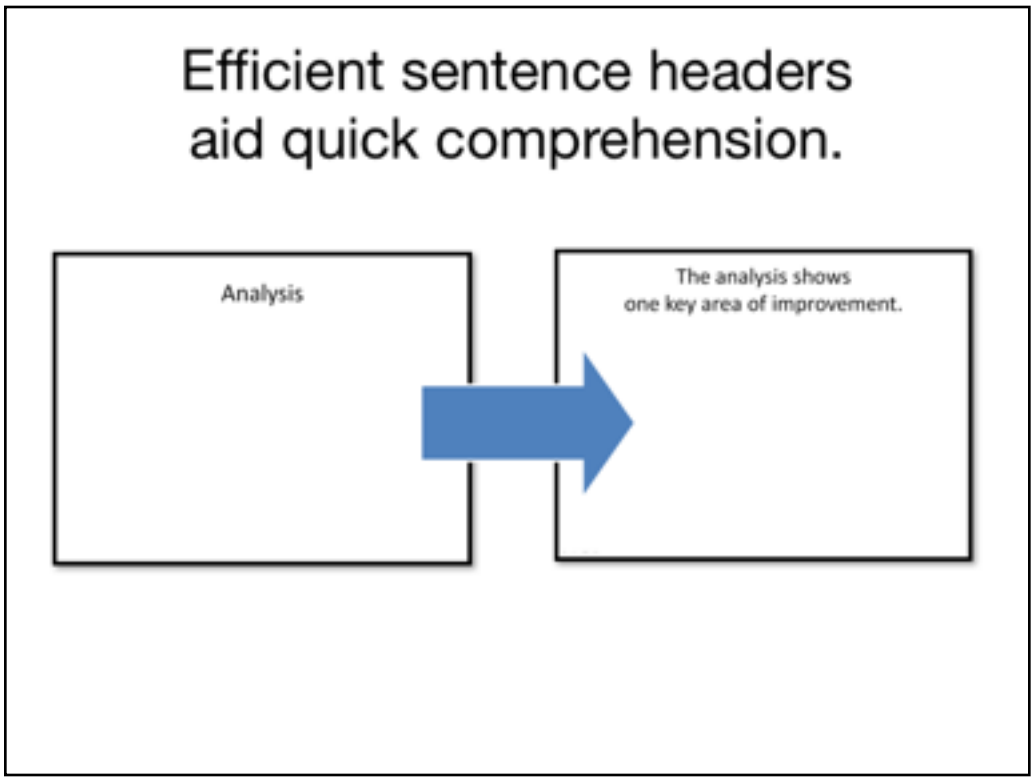
The first way to combat many of the problems we listed there is to get rid of the old models that use fragments for headings. Such snippets of thought only produce confusion and prompt guessing games for the audience. And those short headings are next to useless as archival material.

There are better ways to showcase technical content.

New model =



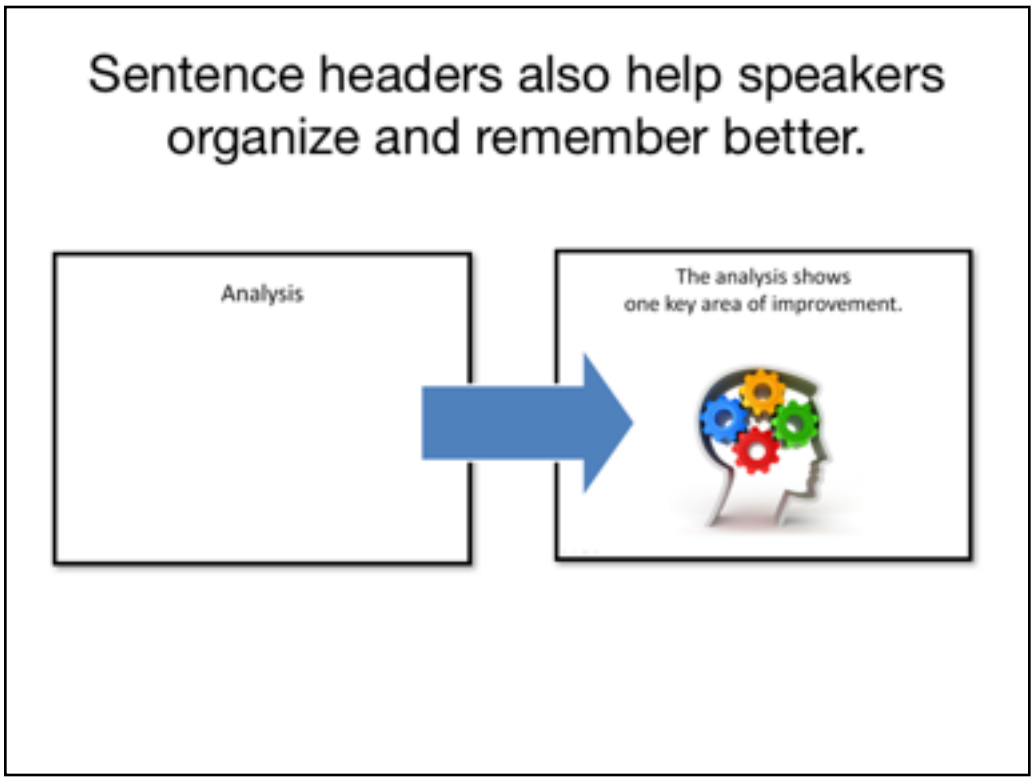
Instead, using full sentence headers allows for one complete thought to be brought forth. Then, the point can be elaborated upon to great degree.



One of the strongest changes you can make to your slides is to use full, short, sentence headers.

Instead of using fragments, or brief phrases, as the basis for your outline, challenge yourself to outline with complete thoughts. This sentence header acts as an executive summary for your learners.

Without having to struggle to fill in the blanks in your thinking, your audience will be better able to retain the information and ideas you are presenting. In addition, your assertions will leave little doubt in your audience's mind as to the direction of your presentation.



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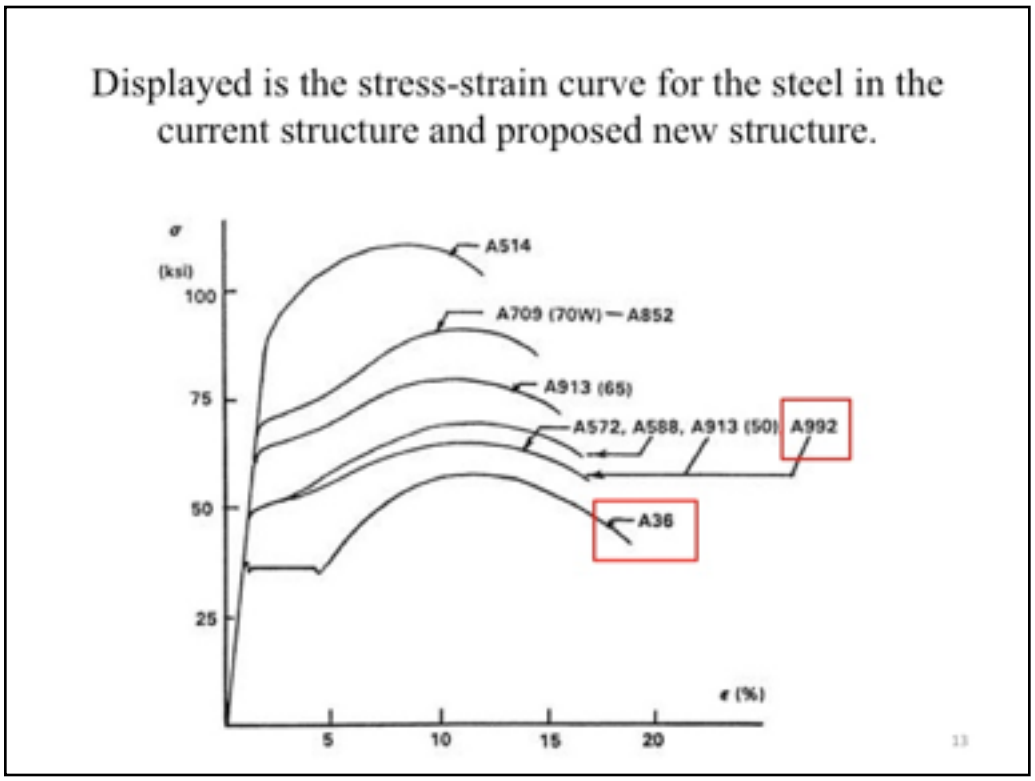
How does the filter remove contaminants?

- The schmutzdecke consumes and adsorbs/absorbs organic contaminants
- Layers of sand strain out particulate contaminants due to the small pores created by fine sand particles

A layer of Schmutzdecke

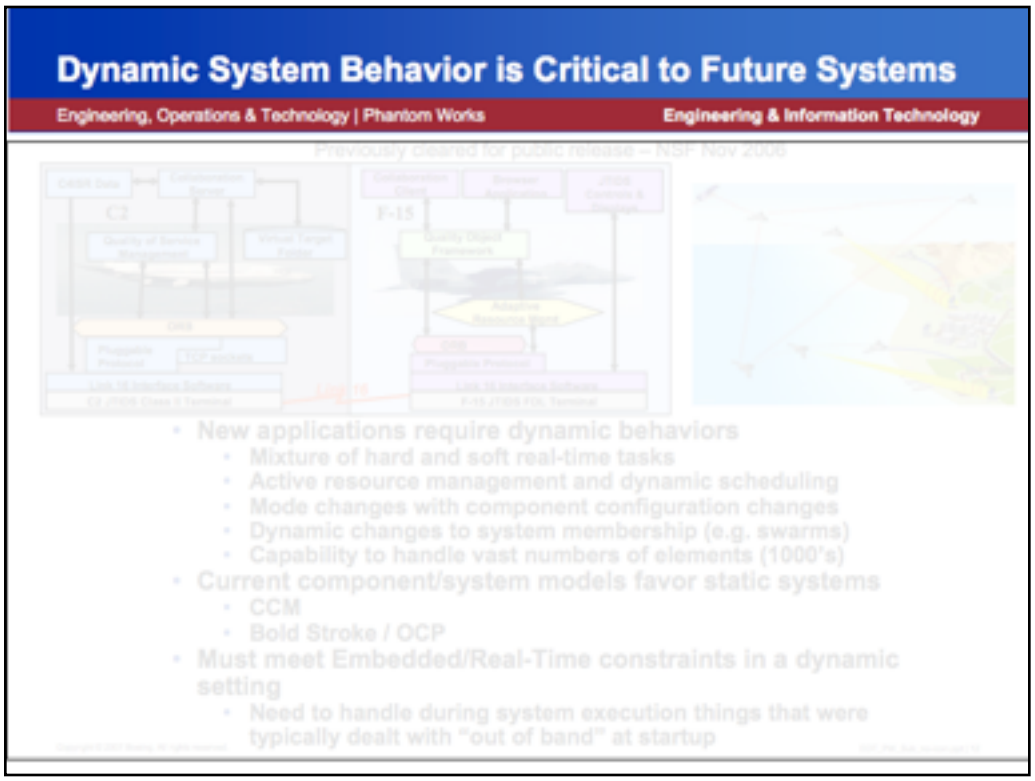
We are moving in the right direction here, but I would advise not using questions as the header UNLESS you actually want the audience to respond. Using questions as transitions is a rookie move.

There's still too much text, but a semi-large photo is a move in the right direction.



This is a great example of how highly technical information can be used with a sentence header. The sentence header is a bit weak, however, since it merely is saying "Here is some stuff. Take a look." You can make a stronger claim about the information than that.

Notice, too, the boxes where the speaker wanted to make a point. These work much better for archival purposes…where a laser would fail after the live event.



Sometimes, a sentence header has shown up in the past, which is great. But they tend to be incidental, not integral. Notice, too, the odd capitalization practices for this sentence header. Don't do that. Just write a normal sentence.

Side note 1: This example shows a header using too many capitalized words. Use regular, traditional, sentence-like capitalization practices for the quickest comprehension by the audiences.

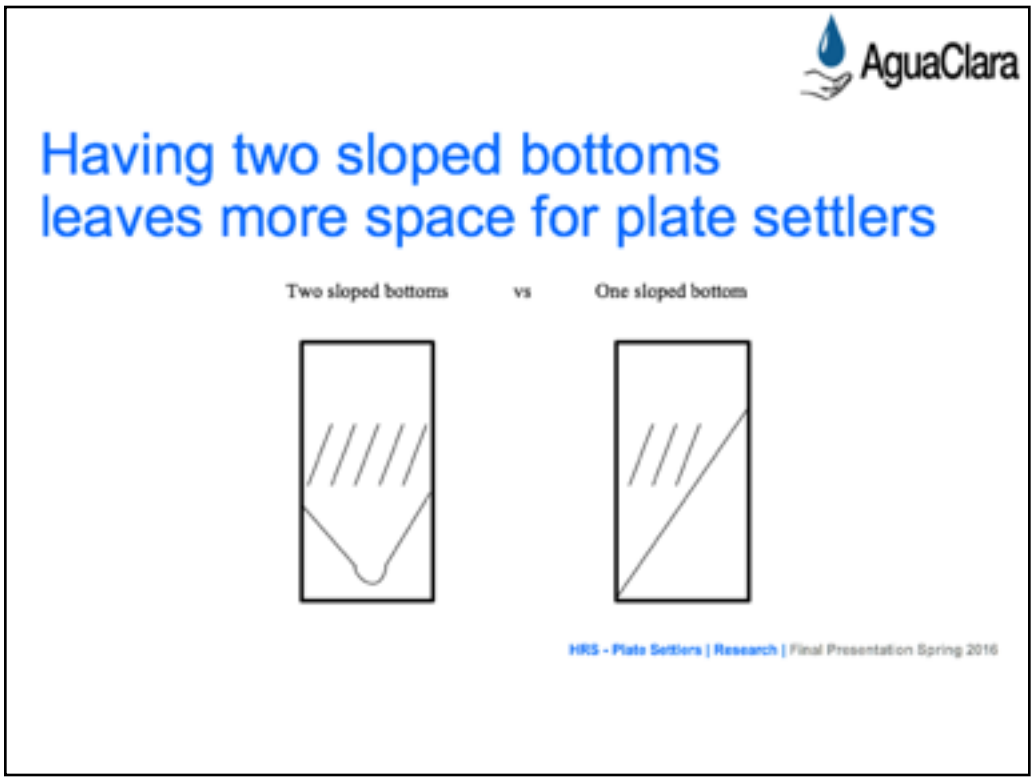
Side note 2: There is too much going on in the middle of this slide, which will bring us to our next point (and it's why I blanked it out here).

Slide source:

Cyber Physical Systems – An Aerospace Industry Perspective

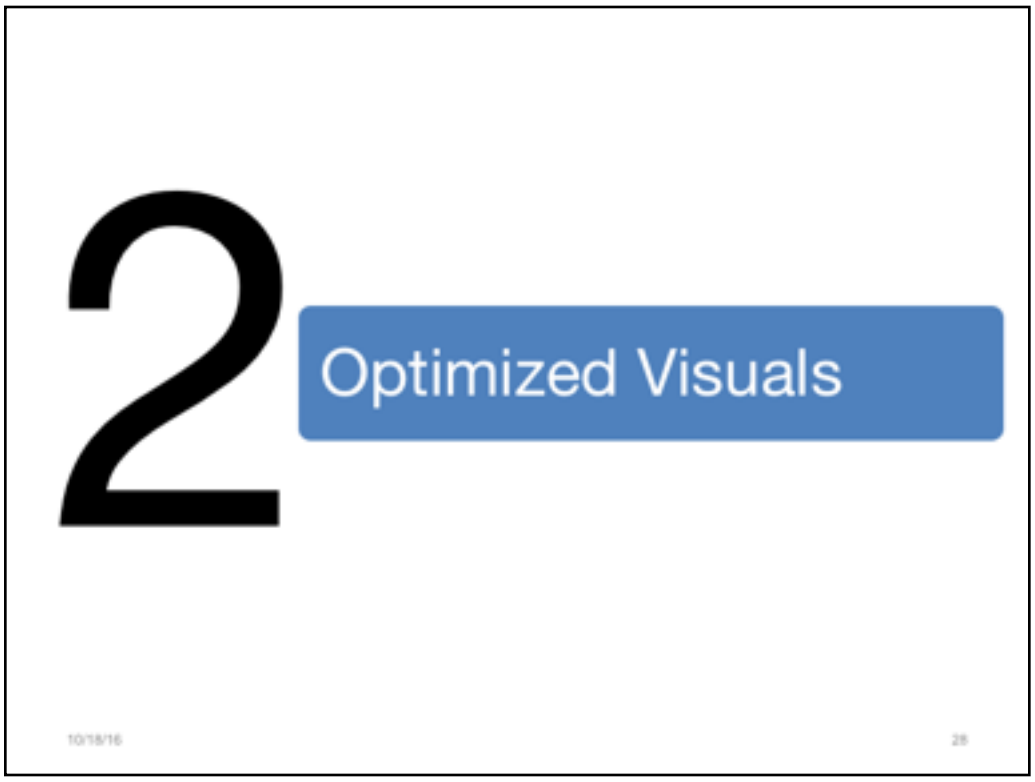
Don Winter , VP- Engineering & Information Technology

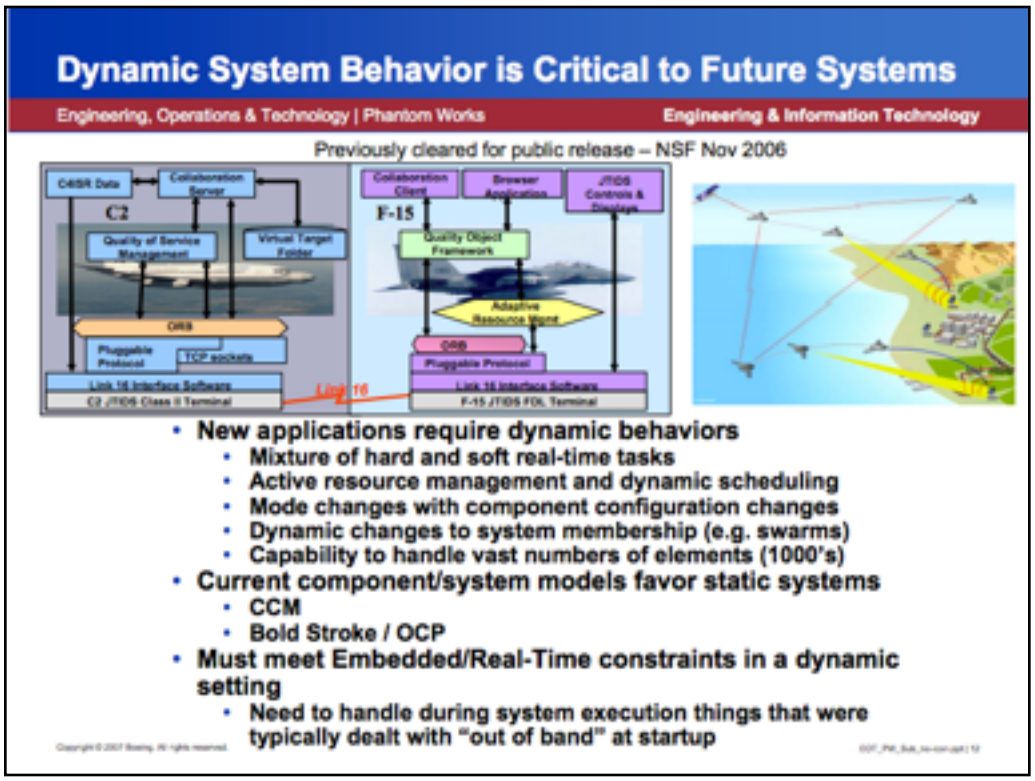
Boeing Phantom Works. 2008.



In this great example from AguaClara spring 2016, we see a good sentence header in place. Well done!

Title: HRS Plate Settlers, spring 2016 Agua Clara


2
Optimized Visuals
10/18/16
28



We are revisiting this slide.

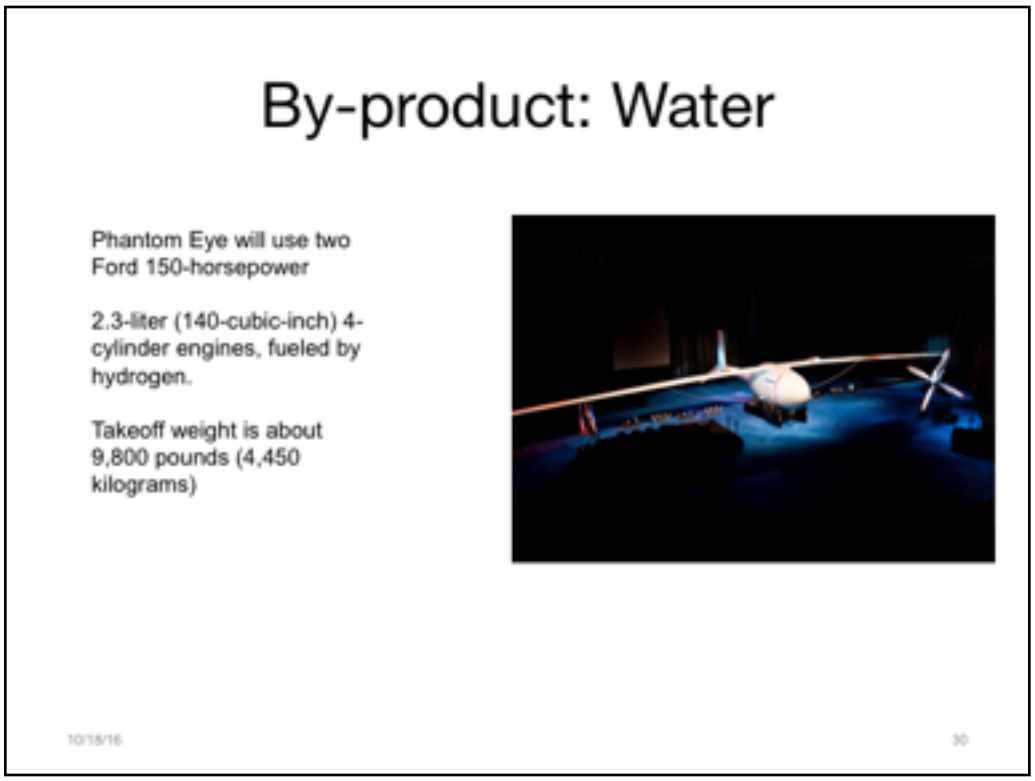
Side note 2: There is too much going on in the middle of this slide. When you pummel the audience with a slide like this, they tune you out and set to the task of deciphering the compelling pictures. This is when key information is lost and the opportunity for interaction and true understanding diminishes exponentially.

Slide source:

Cyber Physical Systems – An Aerospace Industry Perspective

Don Winter , VP- Engineering & Information Technology

Boeing Phantom Works. 2008.



So, let's revisit some old habits.

Here is a fragmented header, which we need to fix.

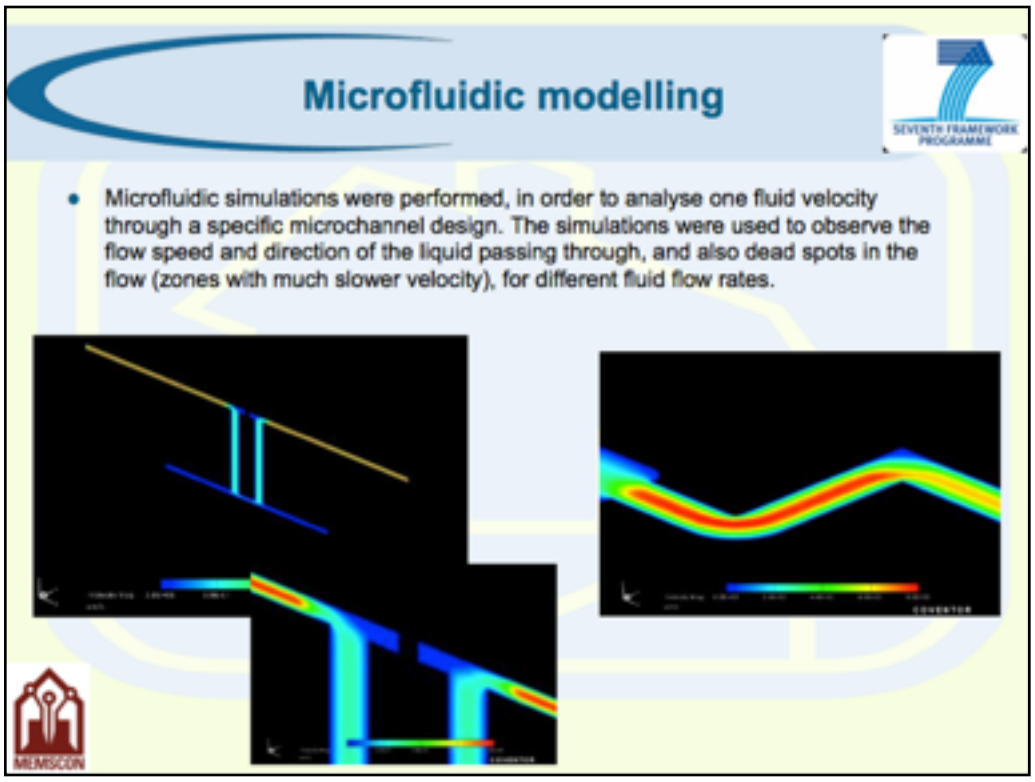
We also see a small picture (targeted visuals are good!) and some text to the side. But the text is small, and the speaker plans to talk about these items aloud anyway.

How can this be improved? What can make the most impact and support the main point?

By reconsidering the main point (water), the speaker is able to hone the take-away message. And don't worry…those specs on the Phantom Eye are still available and easy to see in the Notes. We will get to that in a minute.

But the speaker here has completely made this into a JumboTron moment, where the visual is clean, simple, efficient. The audience will not be struggling to read small bulleted items while she speaks. Their attention will be completely on her, the subject matter expert. After all, that's why we gather for meetings, isn't it? To actually HEAR the experts talks?

Photo courtesy Boeing.com



Let's workshop this one now. We start with a slide like this. Slides such as these is where many of us begin. We have a lot to say. We plop down a header. We know we need to explain ourselves, so we start writing. Oh! But there's visuals, too, so let's throw those in, too.

All of the ideas are correct, but it's how they are executed within the slideware tool that is incorrect. Thus, changes must be made to optimize the audience's experience AND the information contained in the slideware file.

1.sentence header

2.minimize text

3.maximize visuals

4.use notes

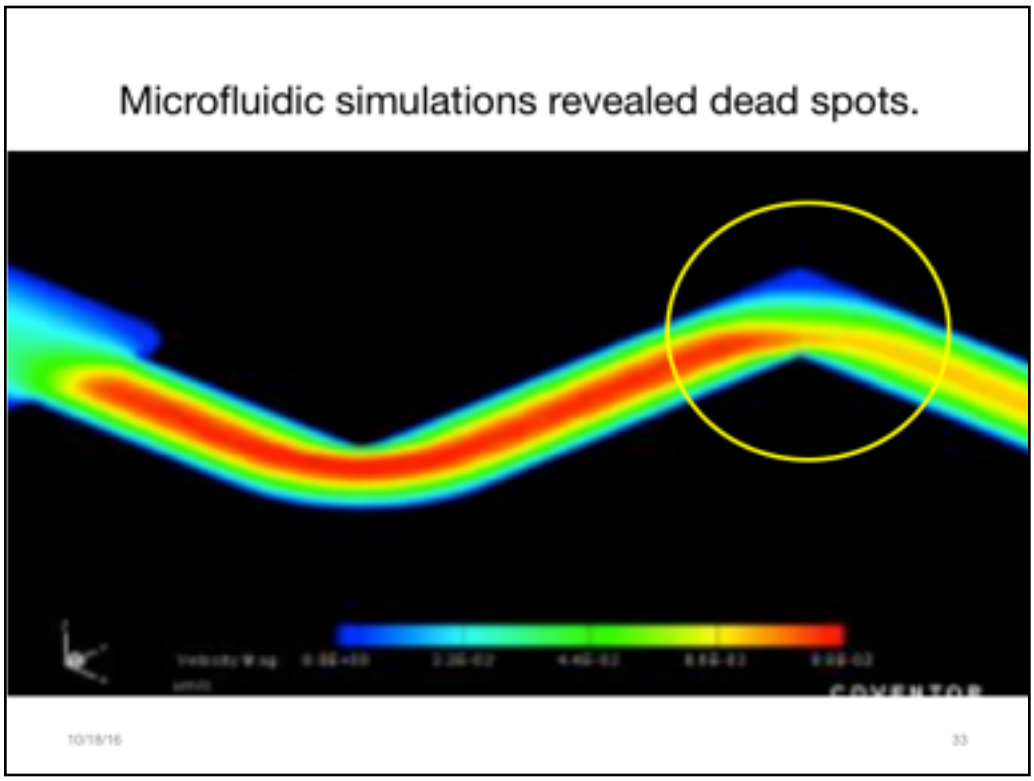
The next slide shows one way this could be done.

Slide source:

Integrated MNT Platforms and Services :Europractice Service Project providing Development Platforms for Integrated Micro-Nano Technologies and Products.

Carmen Moldovan, Bogdan Firtat

IMT-Bucharest



This revised version works better.

For the header, the main point has been pulled out of all of that text.

The most important visual has been magnified so that everyone in the room can see it.

And a circle has been imposed right upon the place where the technical expert all wants us to look.

NOTE: Using shapes is an important alternative to laser pointers. Shapes, arrows, and the like will archive; lasers do not.

The points are clear, concise, and well displayed.

But what about all of the other technical information that was in the original paragraph on the slide? What if someone might need that? (We will come back to that in a few minutes…)

Adapted from

Integrated MNT Platforms and Services :Europractice Service Project providing Development Platforms for Integrated Micro-Nano Technologies and Products.

Carmen Moldovan, Bogdan Firtat

IMT-Bucharest

Now, let's return to this slide, where it's revised a bit.
There's a strong sentence header.
The photo is larger.
And bullet points have been put into the Notes pane.

-----NOTES---
- The schmutzdecke consumes and adsorbs/absorbs organic contaminants
- Layers of sand strain out particulate contaminants due to the small pores created by fine sand particles

---
This revised version of the earlier slide show how to recast the header and emphasize the visuals for the audience. This simplicity in visual message will help keep the audience's attention on you, THE EXPERT!

Here's a great example! Good header, good pics.

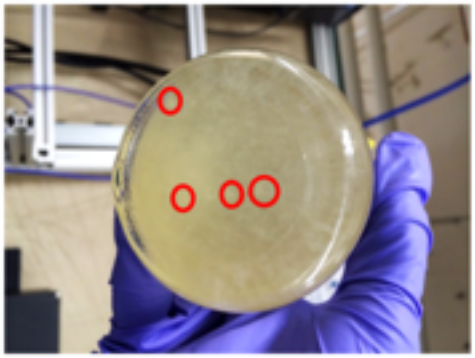
From

High Rate Sedimentation Floc Blanket

Agua Clara Spring 2016

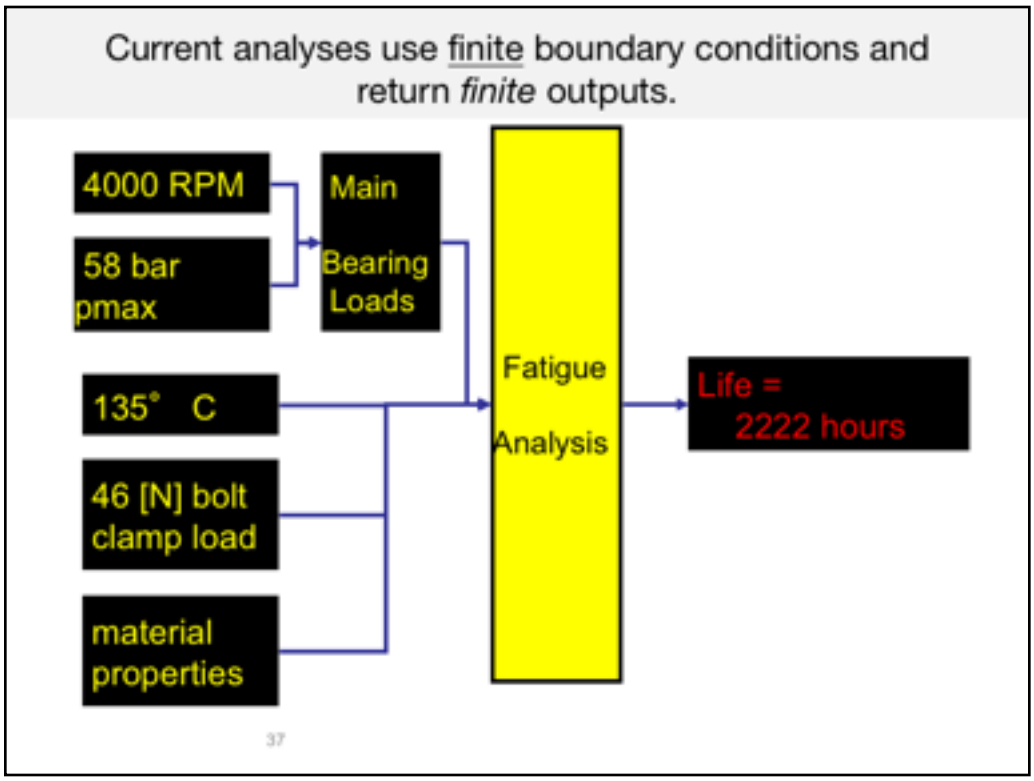
Isolation of colony forming units only occurred in 5g gelatin

AguaClara



And here is another good example from your Sping team.

Now, I stripped out some bullets from the left side. We'll see those return in a minute.



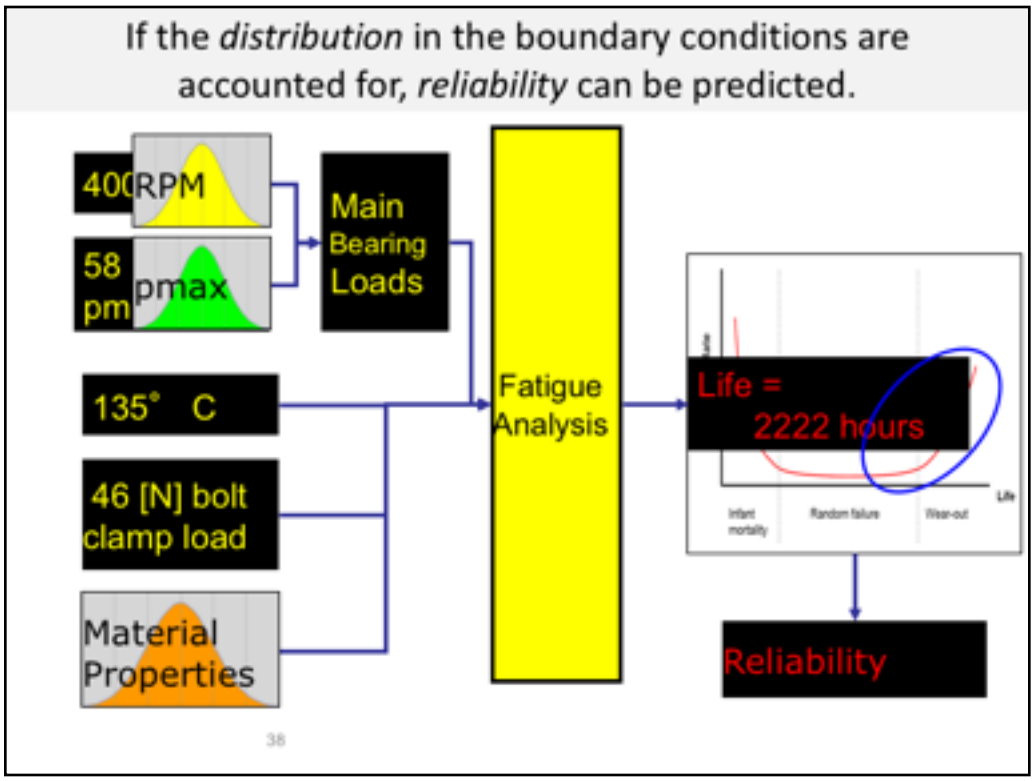
This example is a series of two slides from another graduate student in industry who was arguing for a change from the current analytical approach for life cycle analysis to a more realistic, and statistically reliable approach using very different methods. Instead of bulleting his statements as a traditional slide design would do, he showed the inputs and outputs dynamically as a very memorable process for his audience to take away from his talk.

Content Notes from the original engineering speaker:

The reason that it's hard to quantify the built-in safety factors is because our analyses use finite boundary conditions.

For example….

And return a finite output.



Because of the way he has used animations and visual objects to tell the story of his argument, we get a much more clear, complex, and contextualized view of what he is arguing for here.

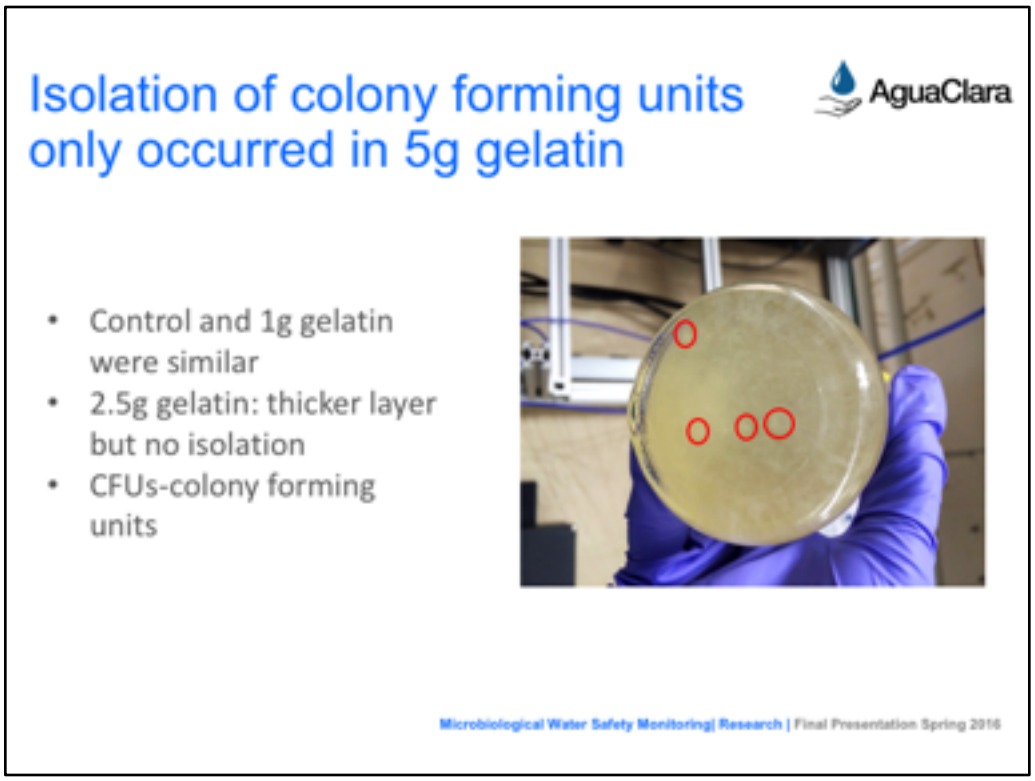
Content notes for original presenter:

But if we could somehow account for the statistical distribution in the boundary conditions, we could calculate reliability instead of a safety-factor (or a fatigue life like my example has).

So, by replacing the finite values of the most important boundary conditions, we can forecast the failure rate – the right side of a bathtub curve.

And that is directly related to reliability.

The end result is actually a plot of reliability over time.

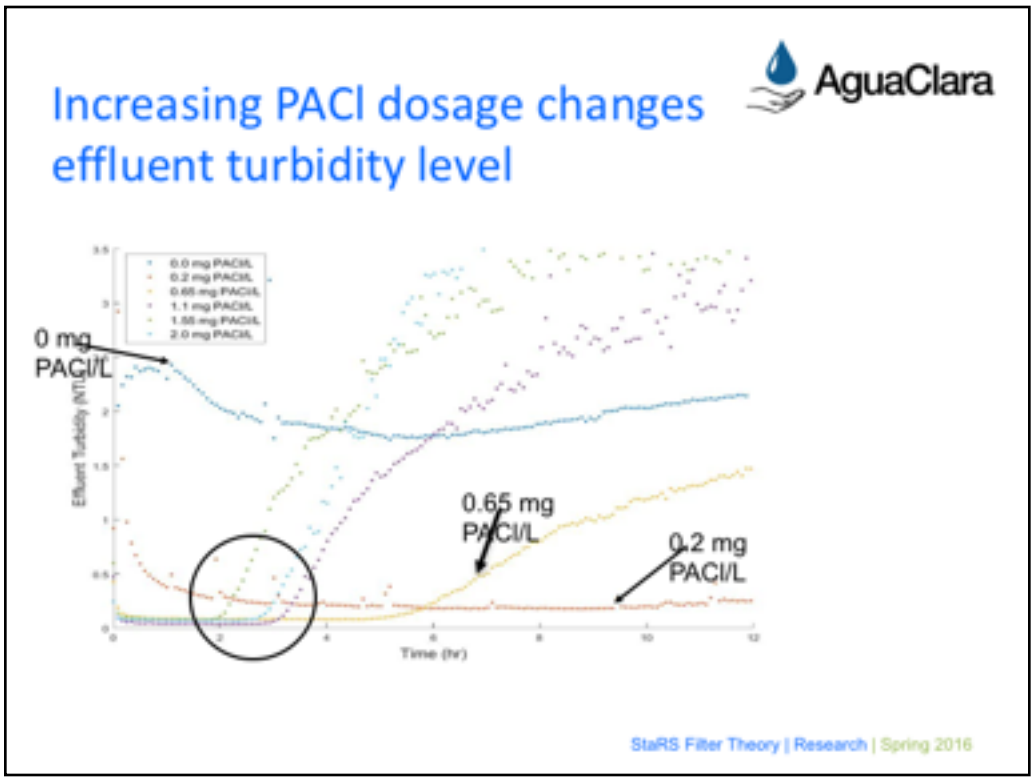


We return to this slide, and in action, those bullets on the left come in one by one at the PRECISE moment they are needed, and not before. We can also pop in the red circles one by one, as needed.

--NOTES----

The bottom of the 5g jar has distinguishable CFUs as some are circled in red. These kinds of colonies could not be observed in the other samples.

Slide source: Microbiological Water Safety Detection
Agua Clara Spring 2016



This spring team brought in the arrows and circle one by one, as needed. Below, I left in the team's original set of notes, too, which will take us nicely into our next point about using Archival Notes.

Jonathan

Here is a zoomed in look at the effluent turbidity that looks at the first 12 hours of filtration

-0 was a control experiment

Without PACl, the filter immediately failed.

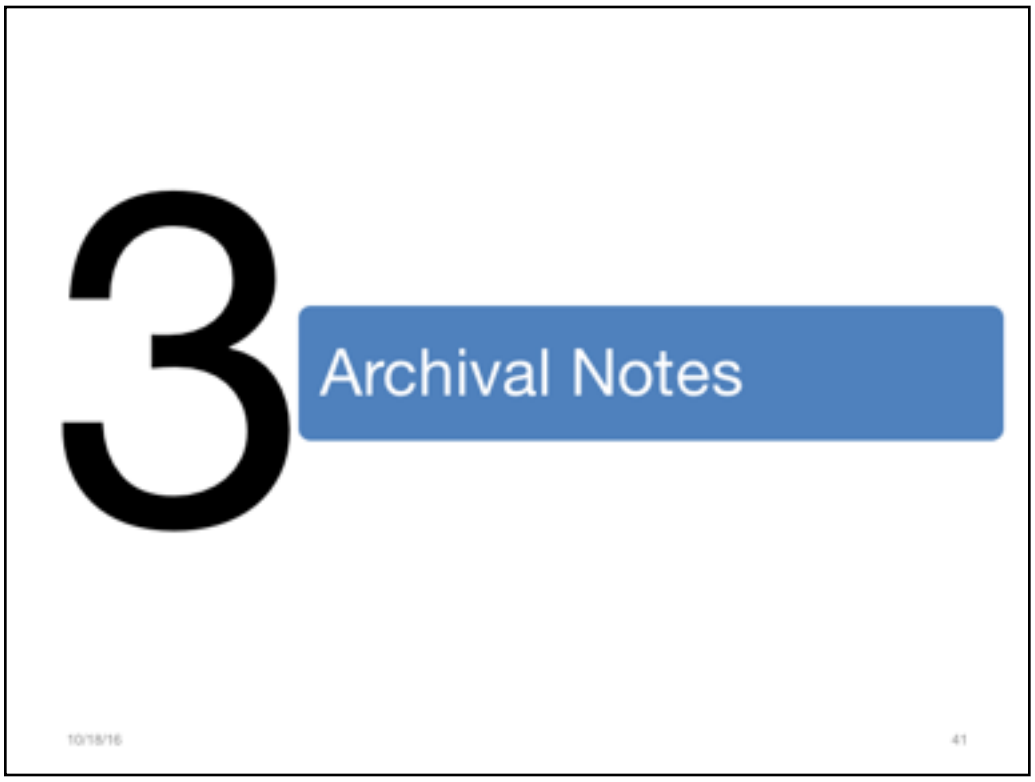
As PACl was added, it decreased the effluent turbidity

As more PACl is added, the filter began to fail quicker

After 24 hours of filtration, the 0.2 mg PACl/L failed after 10 hours

After about 6 hours of filtration, the 0.65 mg PACl/L failed

1.1, 1.55, 2.0 mg PACl/L all failed in under 4 hours


3
Archival Notes
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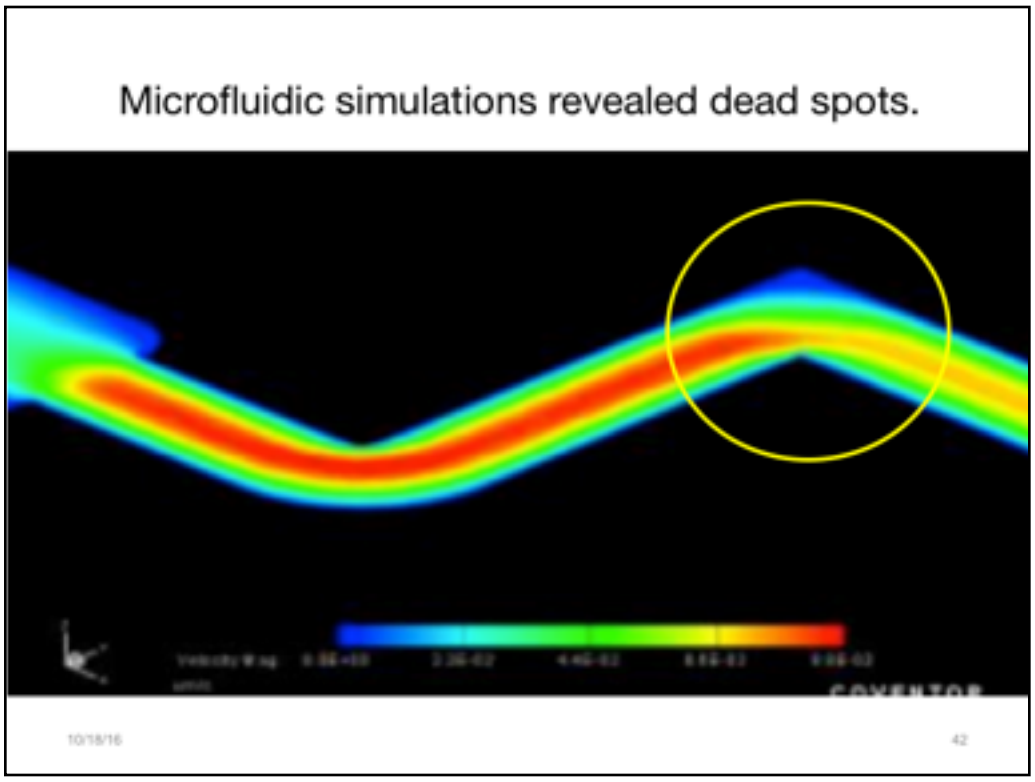

Remember when we were worried about all of the other technical information that was in the original paragraph on the slide? What if someone might need that?

Adapted from

Integrated MNT Platforms and Services :Europractice Service Project providing Development Platforms for Integrated Micro-Nano Technologies and Products.

Carmen Moldovan, Bogdan Firtat

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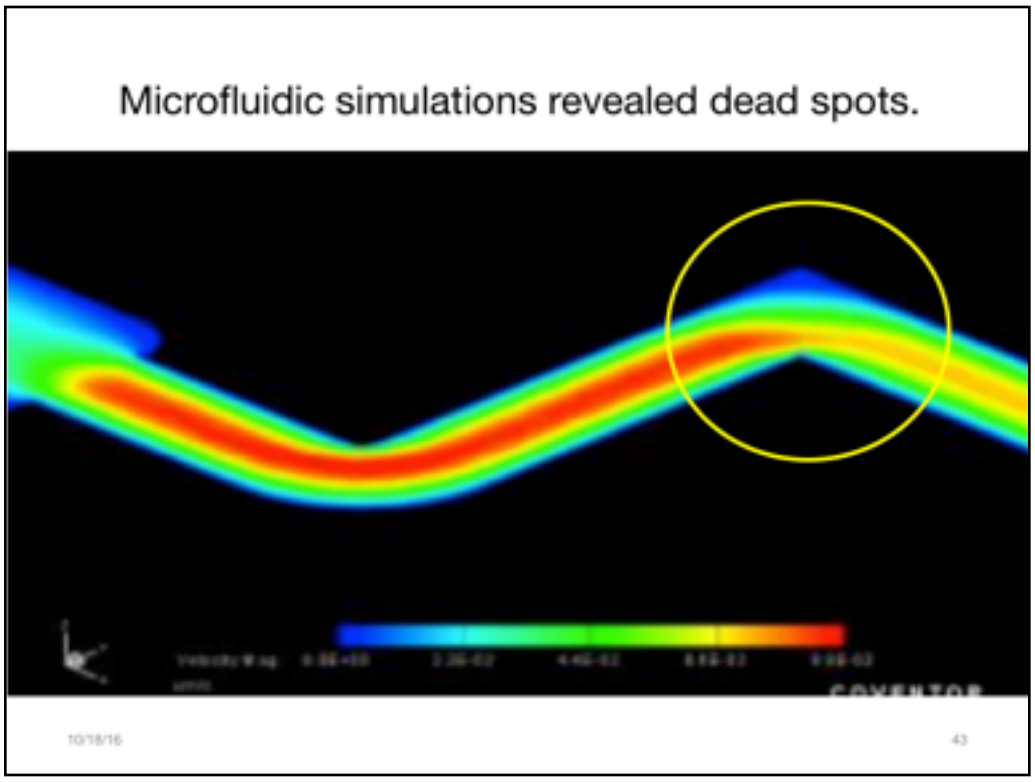
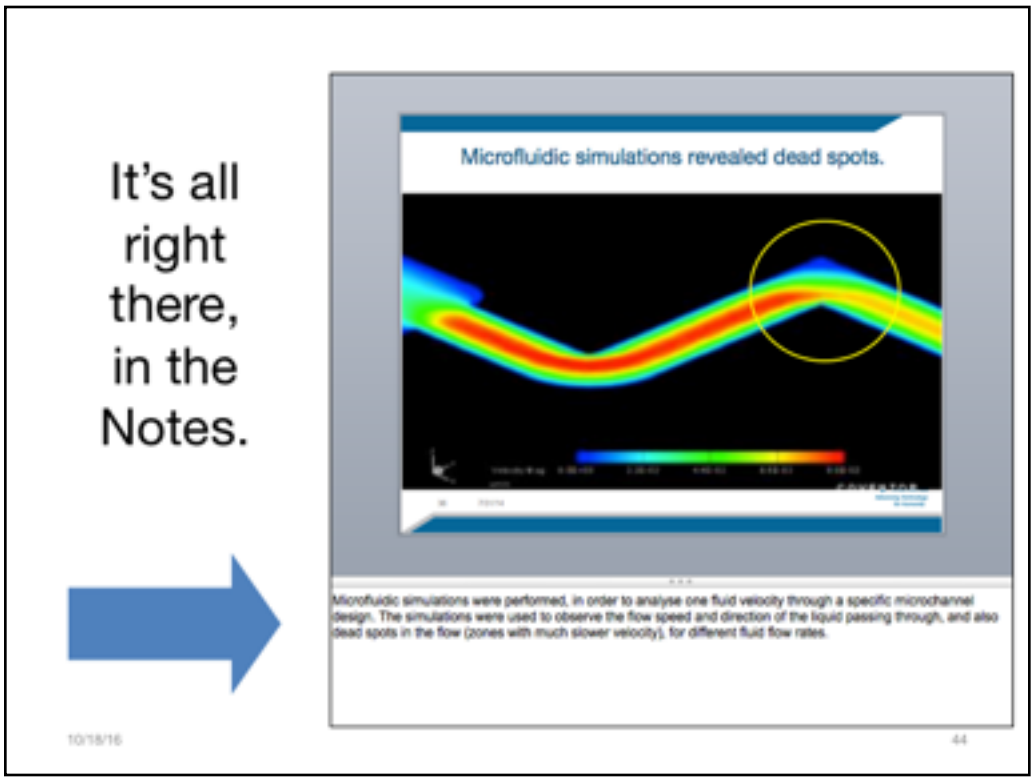


Microfluidic simulations were performed, in order to analyse one fluid velocity through a specific microchannel design. The simulations were used to observe the flow speed and direction of the liquid passing through, and also dead spots in the flow (zones with much slower velocity), for different fluid flow rates.



Remember when we were worried about all of the other technical information that was in the original paragraph on the slide? What if someone might need that info?

It's all been transferred into the Notes pane.

Adapted from

Integrated MNT Platforms and Services :Europractice Service Project providing Development Platforms for Integrated Micro-Nano Technologies and Products.

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IMT-Bucharest

This is a stunningly good example from your Spring 2016 teams.
------NOTES------
The team designed a CHT and fabricated the system using PVC sheets and PVC welding techniques. The CHT was designed with the following design parameters in mind: ease of maintenance; life time and costs of the materials used; stratification of chemicals; using the original dimensions of the float valve and; locally sourced materials.

The dimensions of the PVC welded tank were based on the dimensions of the float valve as well as the size of a human hand and PVC welder. The size of the human hand and PVC welder were considered in order to ensure that they could fit inside the tank during construction and maintenance. The tank design was drawn in AutoCAD and the materials needed to construct the tank (PVC sheets, PVC rods, and ball valves) were purchased. The O-ring used to seal the inside of the tank wall surrounding the float valve is made out of aflas, a material resistant to calcium hypocrite.

The PVC welded tank was designed to be drained and cleaned without needing to disconnect or move the tank. This means that plant operators would no longer need to readjust the float valve to clean the CHT. This would ensure that the proper flow rate is being maintained in order to provide constant chemical dosage to the plant. Operators would clean the tank by closing the influent and effluent valves and opening the drain valve. Then, the operator would pour vinegar into the top of the tank in order to dissolve the scaling. After the scaling is removed, water is used to flush out the tank. Finally, the influent and effluent valves are once again opened, and the drain valve is closed in order to reconnect the CHT to the chemical dosing system.

Another design feature of the new CHT is that it has a sloped bottom so that solids that precipitate in the tank will settle out. This will keep the particles from flowing into the dosing tubes or causing blockages. A drain located on the vertical tank wall just above the sloped bottom will be used to clear the settled material. The angle of the slope was selected arbitrarily to 30 degrees to start with. Had this design been pursued further, the team would have performed experiments to evaluate the optimal slope angle for the precipitate to collect.

Left Figure Caption: This picture shows the prototype of the welded CHT. While the float valve was not in place, the sloped bottom feature can be seen by this picture. In addition, the drainage hole on the opposite vertical walls at the top and bottom of the slope are visible.

Right FIgure Caption: This picture shows an angled view of the tank. The biggest problem with this tank design

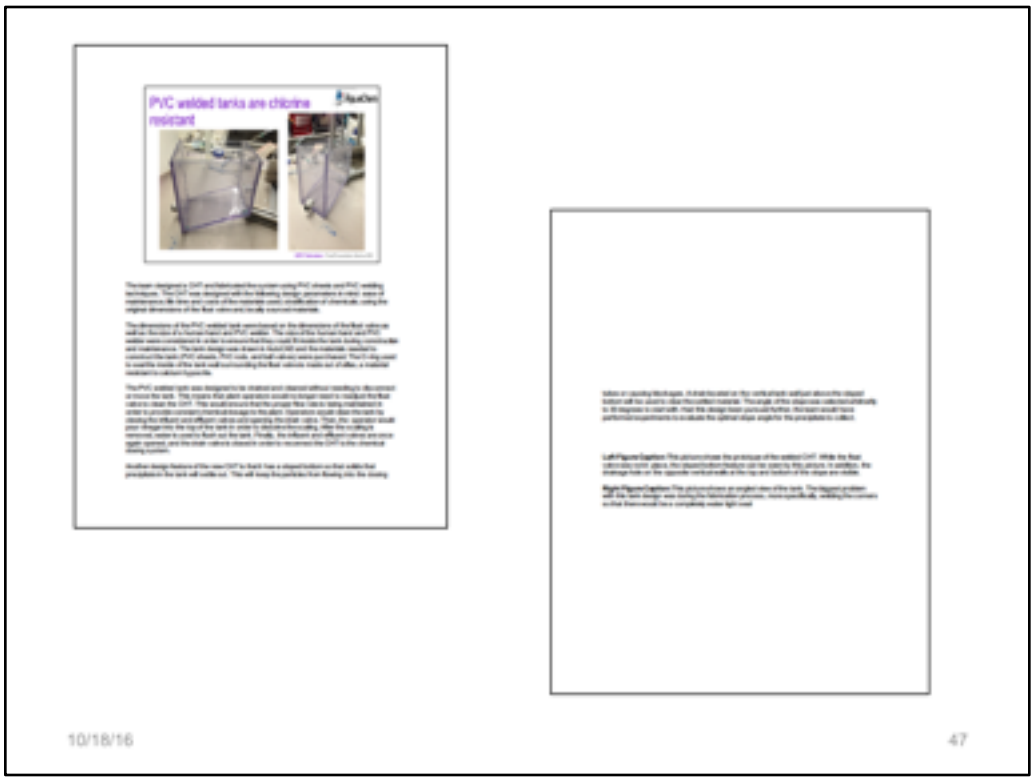
was during the fabrication process, more specifically, welding the corners so that there would be a completely water tight seal

LOOK AT THOSE AMAZING NOTES!

Source:

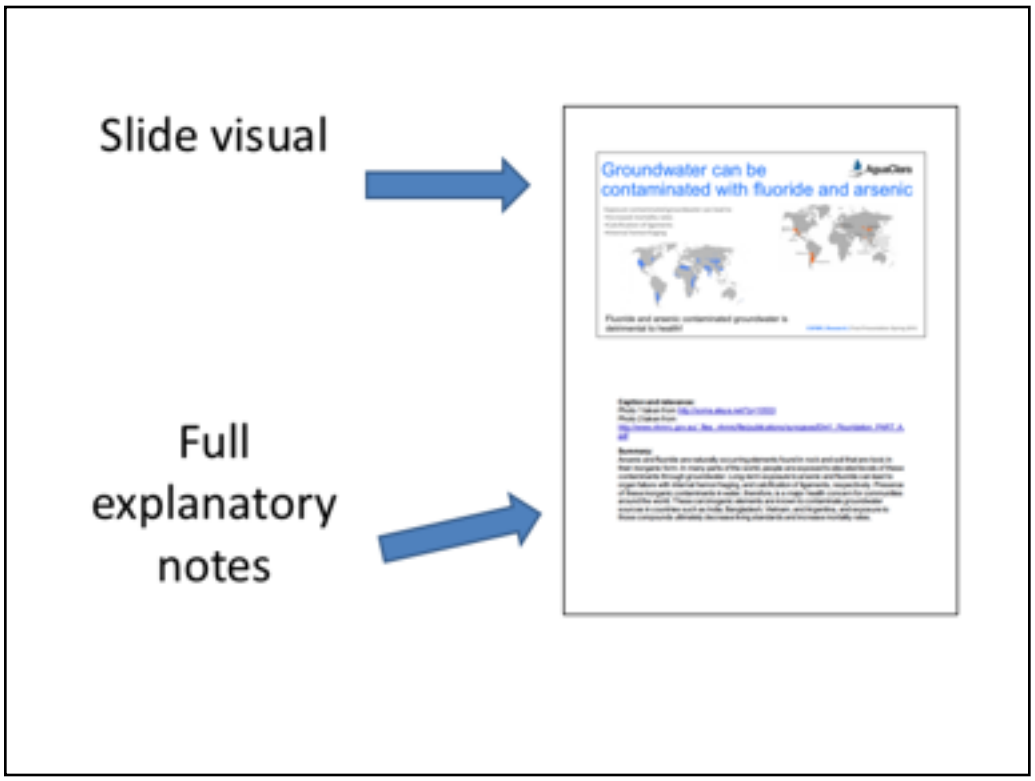
Constant Head Tank

Agua Clara Spring 2016



In fact, when printed as a PDF, the extensive notes go onto two pages. Fantastic!

Using the Notes like makes the slides into amazingly rich archival pieces for future users, future teams, clients, outreach, and so forth. It documents your work thoroughly.

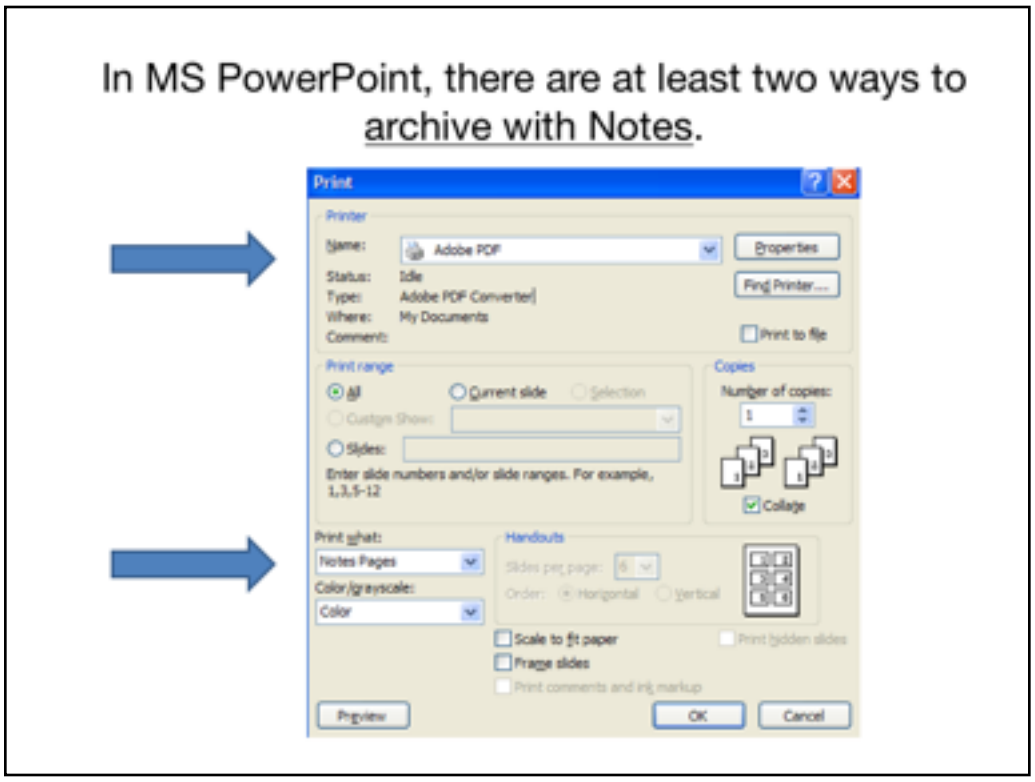


When someone asks you to “just send the slides,” print them as a PDF with Notes.

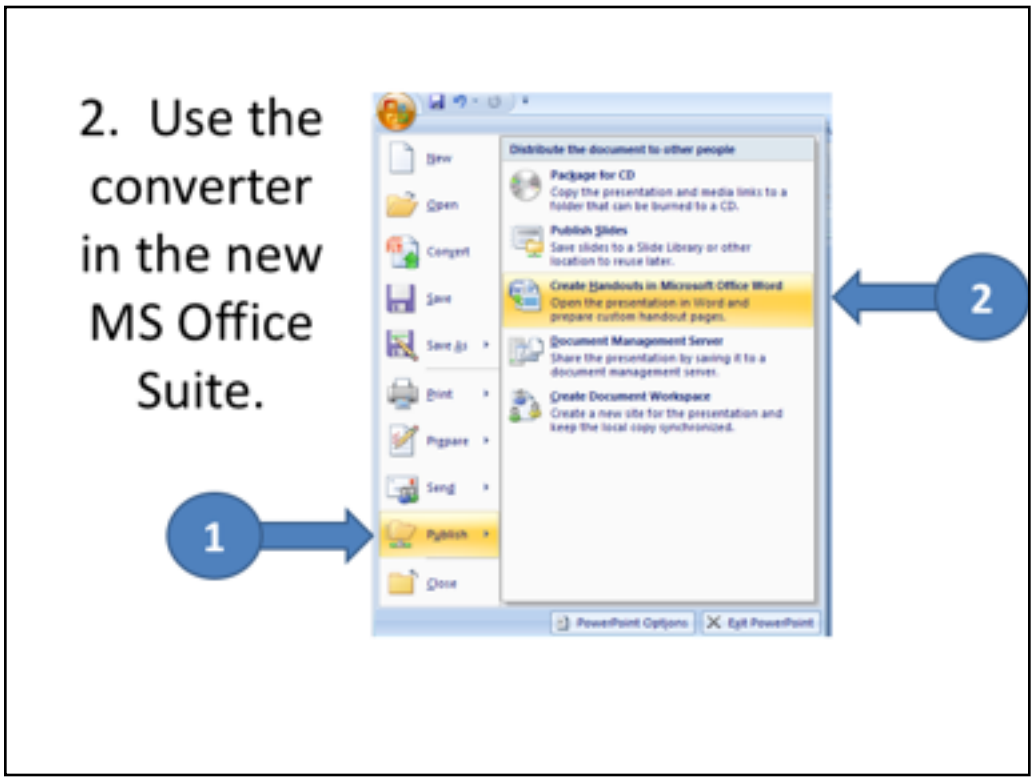
As an outcome, your PDF pages will look like this, with the slide at the top and the notes below.

Using this method actually makes your slide deck more complete, whether as a script for you, as archives for an organization, or as notes for a class.

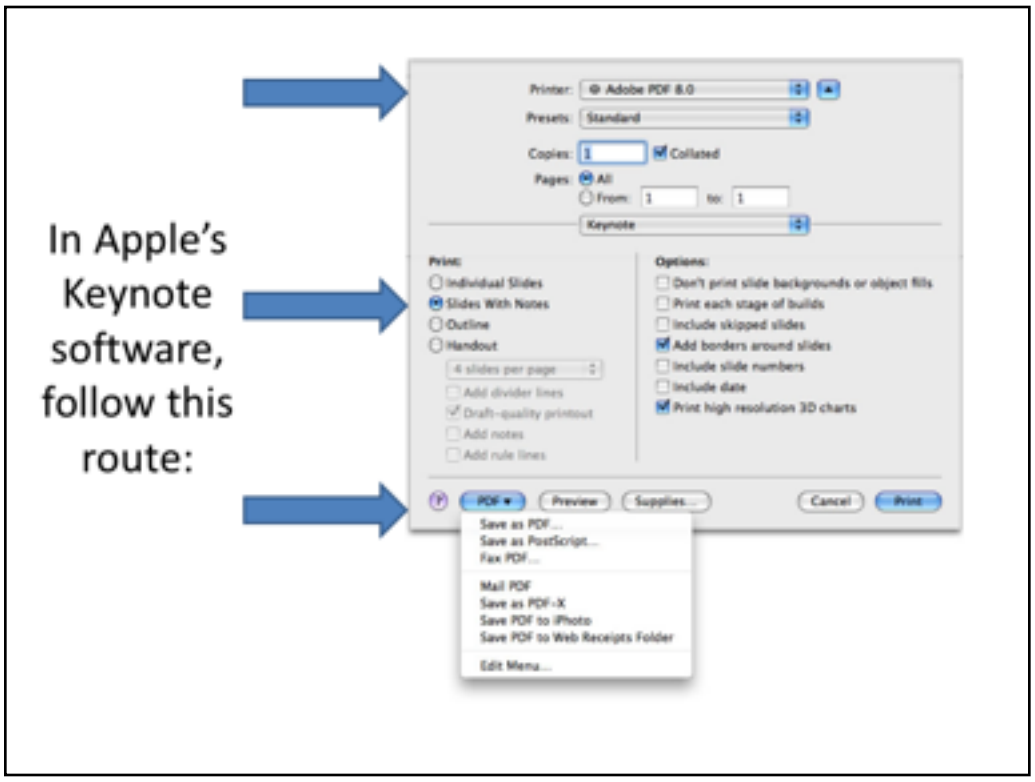
This is a nice example of a spring 2016 using the Notes pane for a Summary AND for citing their sources.



In PowerPoint, choose PRINT. Then choose to print to PDF, making sure that you indicate that you desire NOTES PAGES as the format.



If you are using the newer Microsoft Suite, the path is slightly different. Choose PUBLISH then CREATE HANDOUTS.



In Apple's Keynote, after choose PRINT, be sure to choose PDF, SLIDES WITH NOTES, and then SAVE AS PDF.

Beware of potential mishaps with archival materials.

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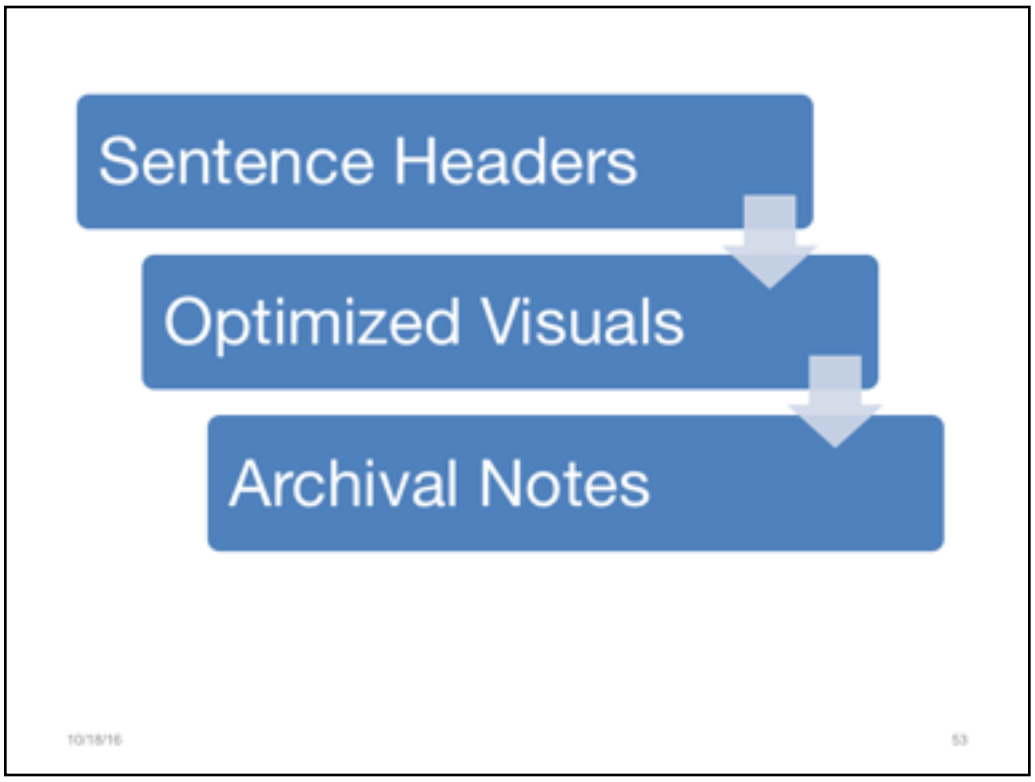
It's often better, especially if you are using webinar software to teams at a distance, to build your layers out over several slides instead of cramming them all onto one slide. Yes, the slide deck gets longer, but it takes NO additional time to cover the same information. Plus it archives better and avoids problems once printed or viewed via PDF.


Sentence Headers
Optimized Visuals
Archival Notes
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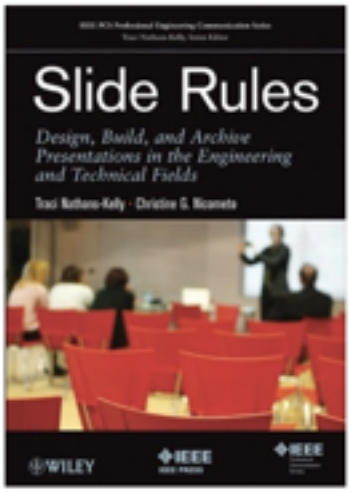
Three simple changes will enrich the entire technical endeavor.

Your stance as
a subject matter expert
will be very apparent.

Apply your expertise
and innovative thinking
towards
engineering communication
practices, too.

Time permitting, let's talk now.

Traci Nathans-Kelly
nathans-kelly@cornell.edu