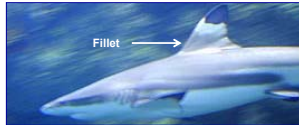


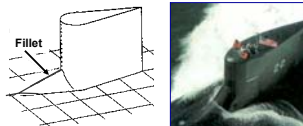
# Rethinking the Design of Presentation Slides

Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark



Fillet on Seawolf submarine



[Devenport et al., 1991]

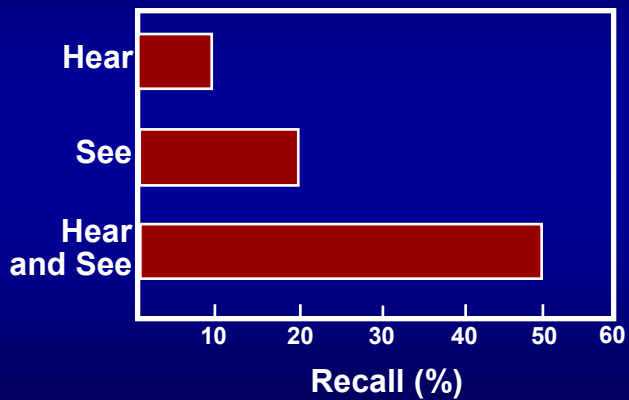


Michael Alley  
College of Engineering  
Virginia Tech

Source: Chapter 4 in *Craft of Scientific Presentations*



An advantage of using slides is that audiences remember more when the slides are well-designed



## For a technical presentation, you should set high goals for the presentation slides

Perfusion is the microscopic flow of blood through tissue

Blood perfusion—  
carries nutrients and waste  
regulates heat exchange  
has units of g/s/mL

Virginia Tech

Slides should help the audience during the talk

Slides should serve as notes for the audience after the talk

Slides should serve colleagues having to make the same talk



## This presentation focuses on two common errors made in the design of slides

Creating slides that no one reads

### PRIMARY CONCERNS -

#### FIELD JOINT - HIGHEST CONCERN

- EROSION PENETRATION OF PRIMARY SEAL REQUIRES REPAIR OF SECONDARY SEAL FOR PRESSURE INTEGRITY
  - IGNITION TRANSIENT - (0-600 MS)
    - (0-170 MS) HIGH PROBABILITY OF EROSION PENETRATION OF SECONDARY SEAL
    - (170-330 MS) REDUCED PROBABILITY OF EROSION PENETRATION OF SECONDARY SEAL
    - (330-600 MS) HIGH PROBABILITY OF EROSION PENETRATION OF SECONDARY SEAL CAPABILITY
- STEADY STATE - (600 MS)
  - IF EROSION PENETRATION OF PRIMARY O-RING SEAL - HIGH PROBABILITY OF NO SECONDARY SEAL CAPABILITY
    - BENCH TESTING SHOWED O-RING NOT CAPABLE OF MAINTAINING CONTACT WITH METAL PARTS GAP OPERATING TO MEQP
    - BENCH TESTING SHOWED CAPABILITY TO MAINTAIN O-RING CONTACT DURING INITIAL PHASE (0 - 170 MS) OF TRANSIENT

Not readable

Creating slides that no one remembers

### Presentation Outline

- Introduction
- Background
- Pre-Combustion Methods
  - Coal switching
  - Coal Cleaning
- Combustion Methods
  - Atmospheric Fluidized Bed
- Post-Combustion Methods
  - Adsorption
  - Absorption
- Conclusions
- Questions?

Not memorable

# One common error is having a slide format that dissuades the audience from reading

PRIMARY CONCERNS -

FIELD JOINT - HIGHEST CONCERN

- EROSION PENETRATION OF PRIMARY SEAL REQUIRES RELIABLE SECONDARY SEAL FOR PRESSURE INTEGRITY
  - IGNITION TRANSIENT - (0-600 MS)
    - (0-170 MS) HIGH PROBABILITY OF RELIABLE SEAL
    - (170-330 MS) REDUCED PROBABILITY OF RELIABLE SEAL
    - (330-600 MS) HIGH PROBABILITY OF NO RELIABLE SEAL
- STEADY STATE - (600 MS - 2 MINUTES)
  - IF EROSION PENETRATES PRIMARY SEAL, HIGH PROBABILITY OF NO SECONDARY SEAL
  - BENCH TESTING CAPABLE OF MAINTAINING CONTACT WITH MECHANICAL SPRING TO MEOP
  - BENCH TESTING CAPABILITY TO MAINTAIN O-RING CONTACT DURING INITIAL (0-170 MS) OF TRANSIENT

**Difficult to read**



# To avoid this error, an easily read typography and layout are needed

Choose legible type

Sans serif type

~~SERIF TYPEFACE~~

Choose a helpful layout

words  
words  
words  
words

words  
words  
words

words



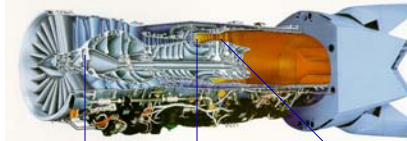
# Much more effective than PowerPoint's default layout is a sentence headline supported by images

Sentence  
Headline

The sentence headline succinctly states  
the main assertion of the slide

Support  
in Body

Body supports  
with images



Body supports  
with needed words

compressor

combustor

turbine



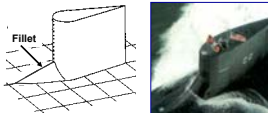
# Three criteria are important in evaluating a layout design for presentation slides

Fillets reduce leading edge vortices in nature  
and in engineering

Fillet on dorsal fin  
of shark



Fillet on Seawolf  
submarine



[Devenport et al., 1991]



How memorable is the  
design?

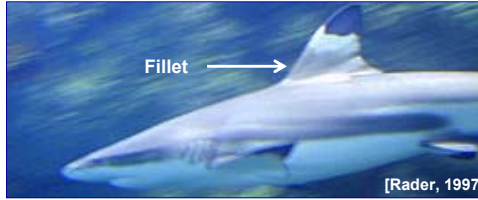
How many slides does the  
design require?

Does the design help the  
slides stand as notes?

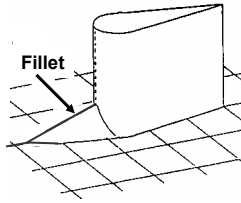


# Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark



Fillet on Seawolf submarine



[Devenport et al., 1991]



## The sentence headline should state succinctly the purpose or assertion of the slide

A strong headline—

identifies the slide's purpose for the audience

identifies the slide's purpose for the speaker

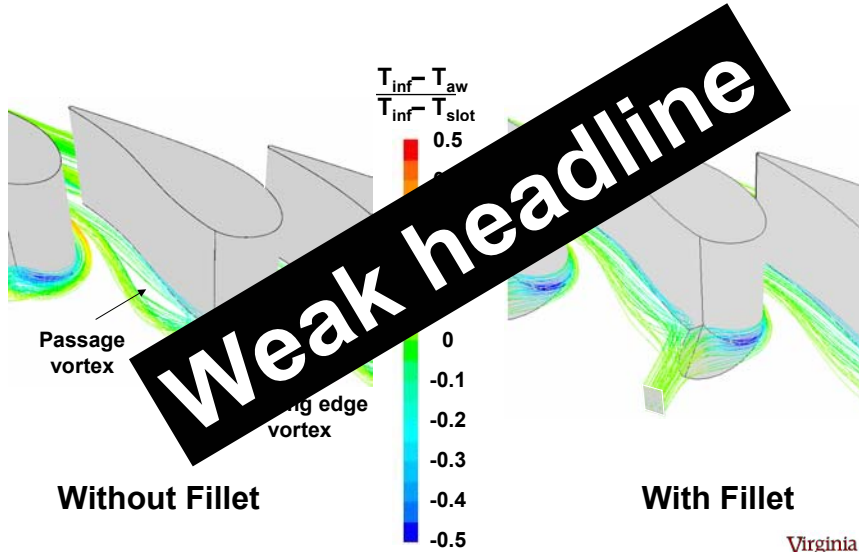
The experimental setup included a Kapton torus and several sensor/actuator combinations



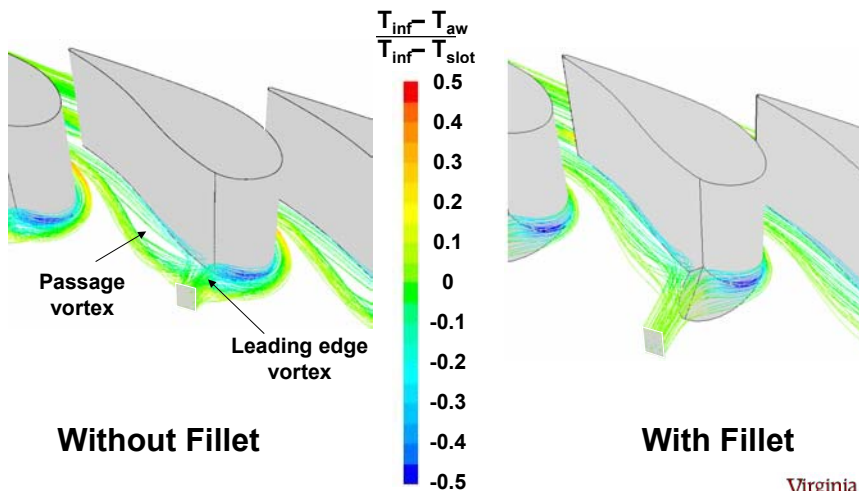
Torus: 1.8 m ring diameter, 0.15 m tube diameter, and 46 $\mu$ m thick (aspect ratio = 0.08)



# Results

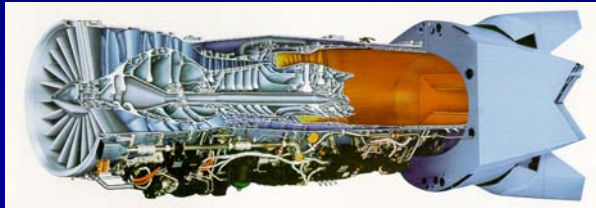


Computations show that the fillet prevents the leading edge vortex and delays the passage vortex



The body of a slide should support the headline primarily with images and with words where needed

Primarily supports with images

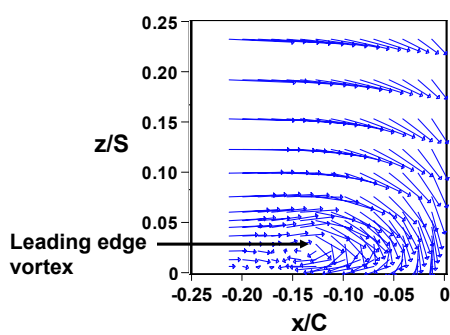


Supports with necessary words

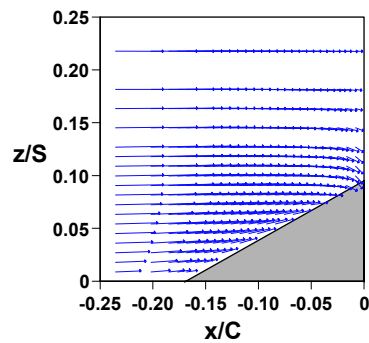
*clear*  
*familiar*  
*concise*



Measurements show that the fillet prevents formation of the leading edge vortex



Velocity profile:  
vane without fillet

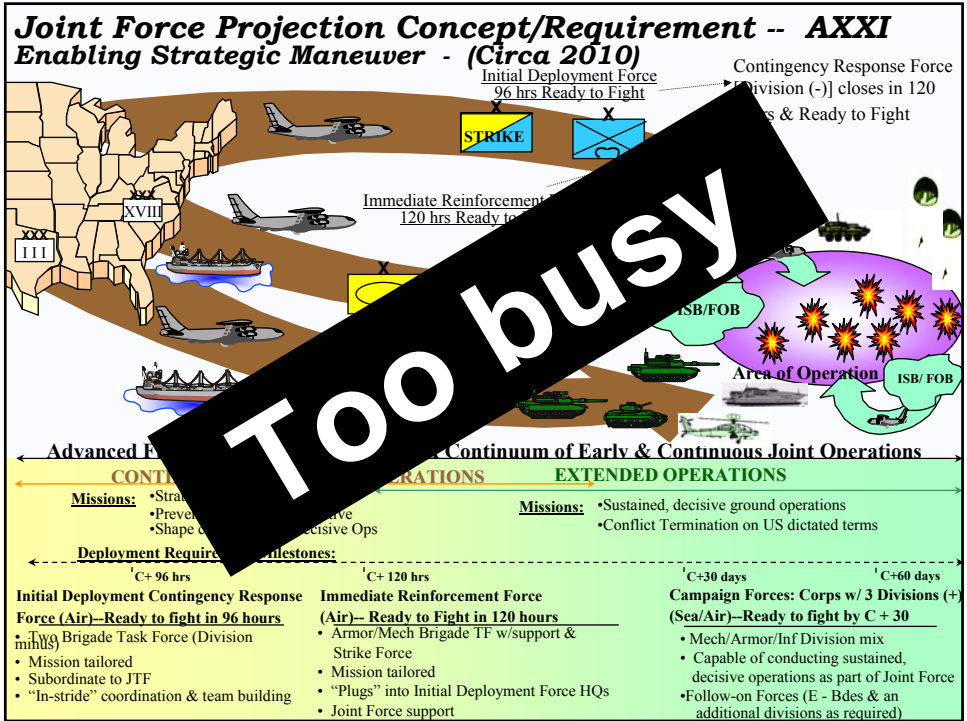


Velocity profile:  
vane with fillet

# Literature Review

- Hefner developed a dynamic electro-thermal model of a power MOSFET. The model is a temperature-dependent IGBT electro-thermal model. The model is presented in terms of the instantaneous and average power dissipation. The model is used to simulate the instantaneous and average power dissipation of the silicon chip. The model is used to simulate the SABER circuit.
- Adam et al. developed a model of the interactions between the heat sources, sinks, and walls of a power MOSFET. The model is used to determine the thermal behavior of discretely heated enclosures. The model is used to determine the thermal behavior of discretely heated enclosures.
- Chen, Wu and et al. are modeling of thermal and electrical behavior using several commercial softwares (I-DEAS, Maxwell, Flotherm and Saber) and 3-D, transient approaches.

**Too many words**



**Too busy**



## A second common error is showing slides that the audience reads, but does not remember

### Presentation Outline

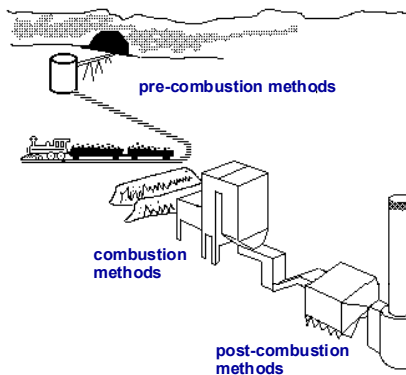
- Introduction
- Background
- Pre-Combustion Methods
  - coal switching
  - coal cleaning
- Combustion Methods
  - atmospheric fluid bed
- Post-Combustion Methods
  - adsorption
  - absorption
- Conclusions
- Questions?

**Not memorable**



## To make slides memorable, you have to consider what to include and what to exclude

This presentation compares several methods for reducing emissions of sulfur dioxide



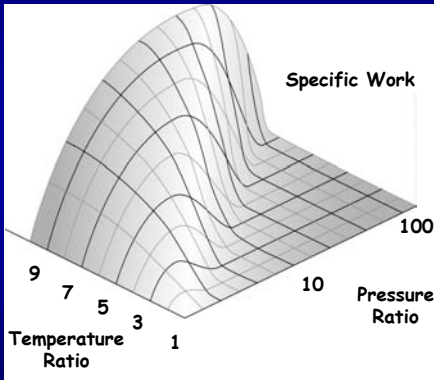
What to include

What to exclude

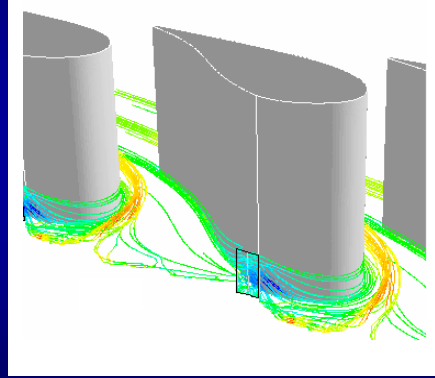


# Slides should include key results and images

## Results



## Images



# Slides should also include signals for the presentation's organization

## Beginning

Methods to Reduce Sulfur Dioxide Emissions From Coal-Fueled Utilities

Cynthia Schmidt  
Mechanical Engineering Department  
University of Texas

Three classes of methods exist for reducing emissions of sulfur dioxide

Mapping

## Middle

Coal switching and coal cleaning are two pre-combustion methods

Middle 1

The most effective combustion method is an atmospheric fluidized bed

Middle 2

- High capital cost—can use in existing equipment
- High operating cost
- Ability to use different grades of coal

## Ending

By using these methods, coal utilities can greatly reduce SO<sub>2</sub> emissions

Method	Percentage Reduction of SO <sub>2</sub>
coal cleaning	40%
coal switching	20%
fluidized bed	80%
atmospheric	85%
etc.	60%

Conclusion



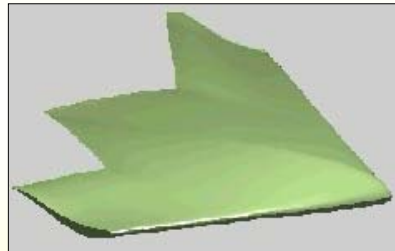
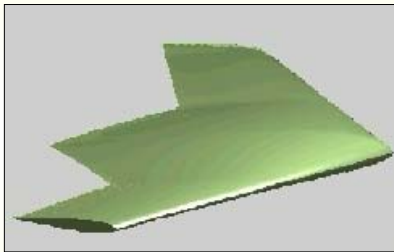
# Computational Analysis of the Aerodynamic Energy Required of Morphing

**Needs image  
to orient**

Greg Pettit, Harry Robertshaw, and Daniel J. Inman  
Center for Intelligent Materials, Systems and Structures  
Air Force Office of Scientific Research (F49620-99-1-0294)



# Computational Analysis of the Aerodynamic Energy Required of Morphing Wings



Greg Pettit, Harry Robertshaw, and Daniel J. Inman  
Center for Intelligent Materials, Systems and Structures  
Air Force Office of Scientific Research (F49620-99-1-0294)



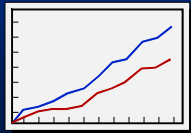
## This presentation evaluates composite materials for the bipolar plates of fuel cells



Role of bipolar plates  
in fuel cells



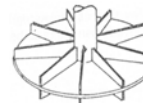
Comparison of bipolar  
plate materials



Evaluation of bipolar  
plate performance



An arresting system shortens the landing  
distance without sacrificing aircraft performance



arresting  
system

Arresting system for aircraft carrier



**In summary, the phantom for blood perfusion has many useful applications**

The phantom can—

produce reasonable and reproducible perfusion

allow for simple and inexpensive construction

be modified for future experiments



Questions?

**Questions?**  
**Missed Opportunity**

## Review of Test Data Indicates Conservatism for Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 S... Research data
  - Crater overpredicted penetration significantly
    - Initial penetration to depth
      - Varies with volume (3cu.in)
    - Significant... Crater SOFI particle to penetration coating
    - ... possible at sufficient mass
    - Co... is penetrated SOFI can cause significant damage
  - Flight conditions is significantly outside of test database
    - Volume of ramp is 1920cu in vs 3 cu in for test

**Too many levels of detail**



2/21/03

6

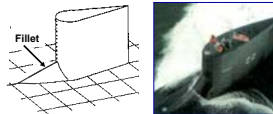
**In summary, the slide design given here is much stronger than PowerPoint's default design**

Filletlets reduce leading edge vortices in nature and in engineering

Filletlet on dorsal fin of shark



Filletlet on Seawolf submarine



[Devenport et al., 1991]



The design is more memorable for audience

The design requires fewer slides (thus better pacing)

The design produces notes that stand alone

The design creates a more compelling argument

Summary: page 116 in *Craft of Scientific Presentations*

Templates: <http://writing.eng.vt.edu/csp.html>

