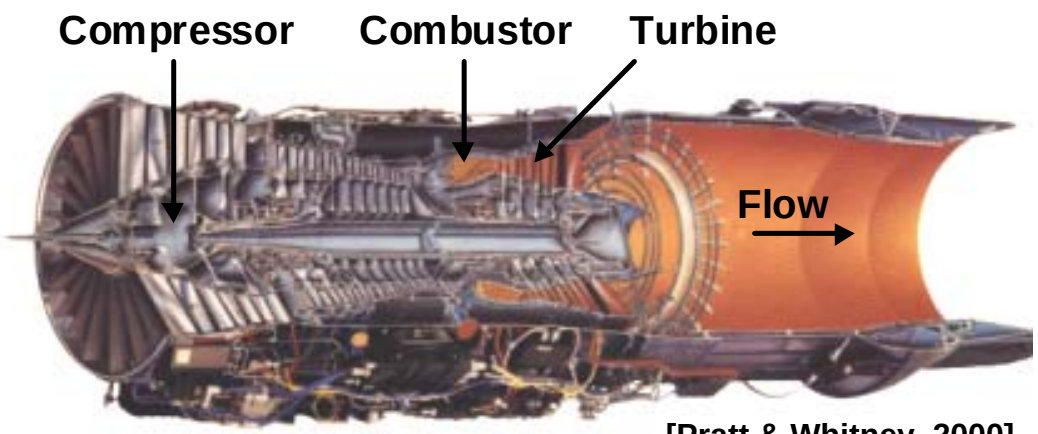
Rethinking the Design of Presentation Slides

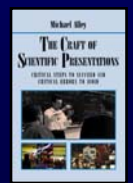
Our aim is to improve the cooling of turbine vanes downstream of the combustor



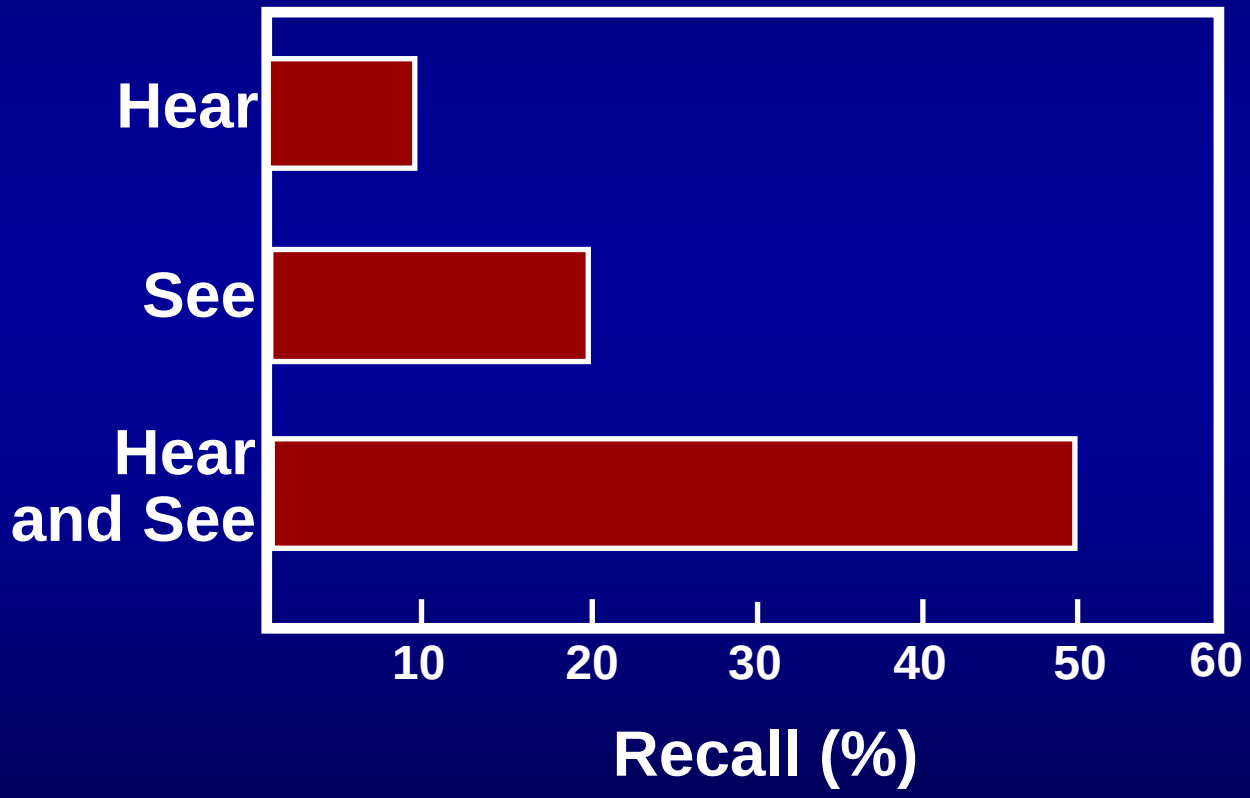
[Pratt & Whitney, 2000]

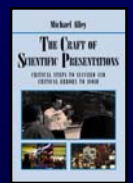
Michael Alley
Virginia Tech

Source: Chapter 4 in *The Craft of Scientific Presentations*

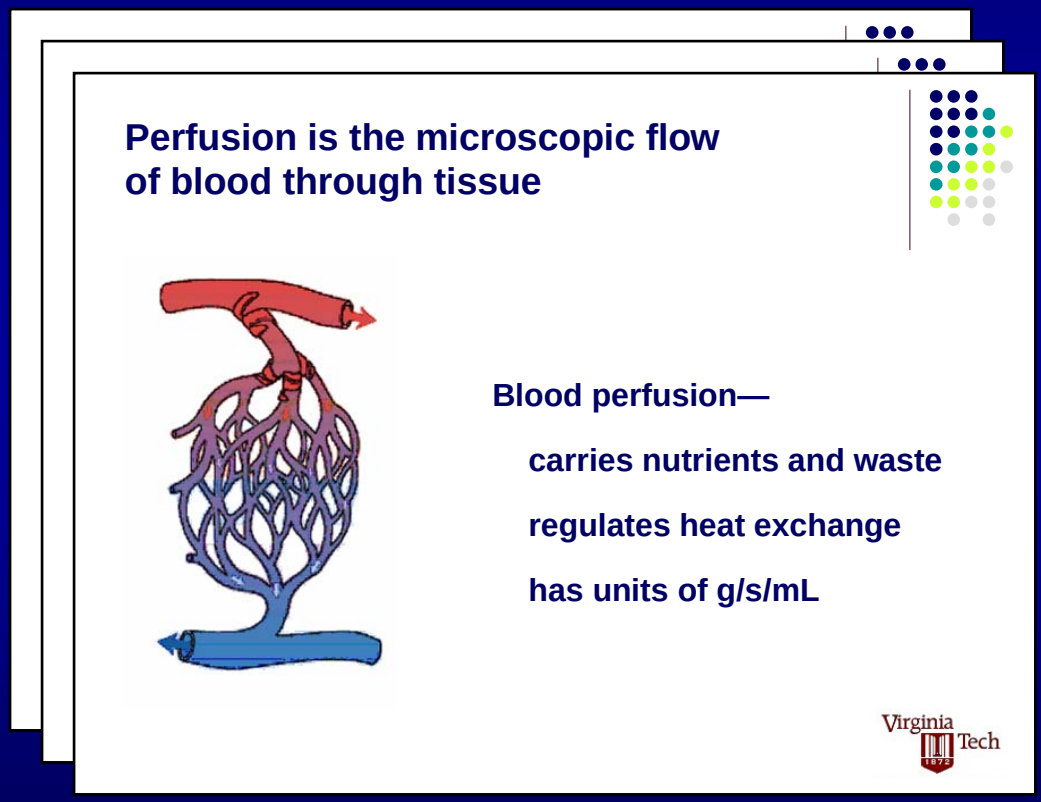


The audience remembers more when you use well-designed slides





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



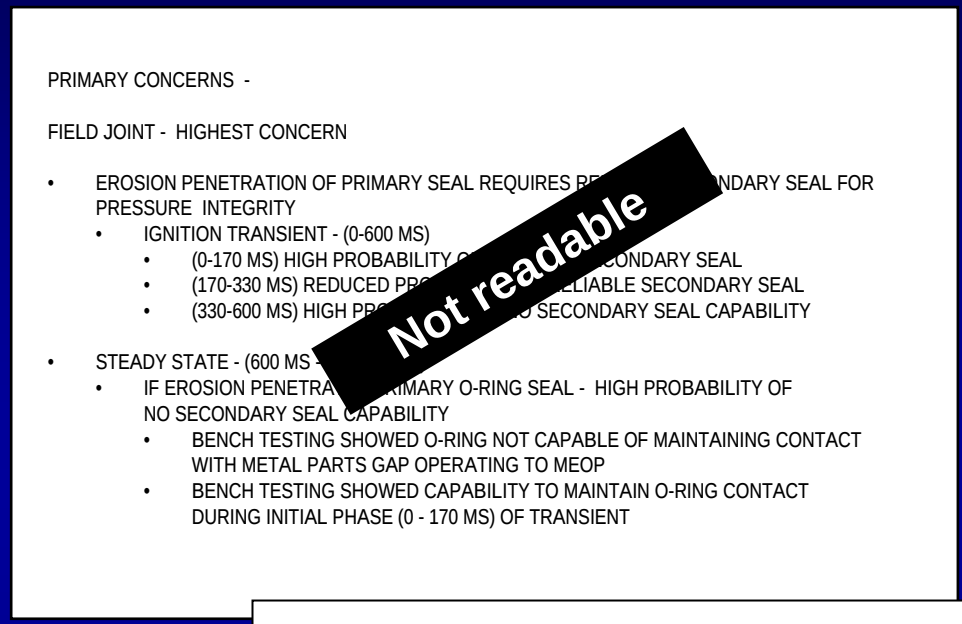
Slides should help the audience during the talk

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



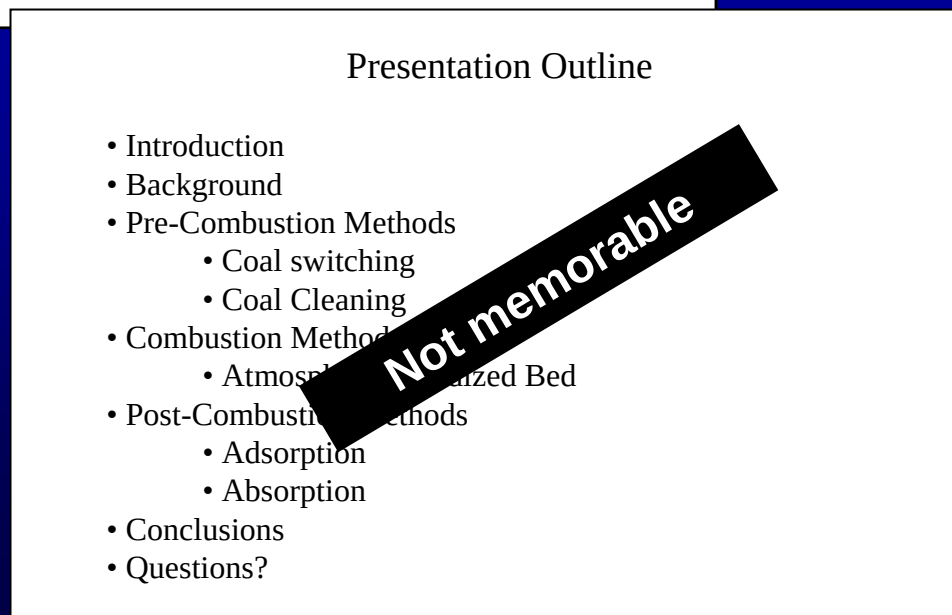
PRIMARY CONCERNS -

FIELD JOINT - HIGHEST CONCERN

- EROSION PENETRATION OF PRIMARY SEAL REQUIRES RE… NDARY SEAL FOR PRESSURE INTEGRITY
  - IGNITION TRANSIENT - (0-600 MS)
    - (0-170 MS) HIGH PROBABILITY O… CONDARY SEAL
    - (170-330 MS) REDUCED PR… LIABLE SECONDARY SEAL
    - (330-600 MS) HIGH PR… SECONDARY SEAL CAPABILITY
- STEADY STATE - (600 MS …
  - IF EROSION PENETRA… RIMARY 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 MEOP
    - 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 Metho…
  - Atmosp… …ized Bed
- Post-Combusti… …thods
  - Adsorption
  - Absorption
- Conclusions
- Questions?

Not memorable

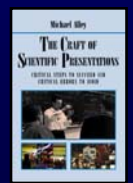
One common error is having a slide format that dissuades the audience from reading

PRIMARY CONCERNS -

FIELD JOINT - HIGHEST CONCERN

- EROSION PENETRATION OF PRIMARY SEAL REQUIRES RE… …RY SEAL FOR PRESSURE INTEGRITY
  - IGNITION TRANSIENT - (0-600 MS)
    - (0-170 MS) HIGH PROBABILITY OF R… …ARY SEAL
    - (170-330 MS) REDUCED PROBA… …LE SECONDARY SEAL
    - (330-600 MS) HIGH PROBA… …ONDARY SEAL CAPABILITY
- STEADY STATE - (600 M…
  - IF EROSION RE… …RY O-RING SEAL - HIGH PROBABILITY OF NO SECONDARY SEAL CAPABILITY
    - BENCH TE… …HOWED O-RING NOT CAPABLE OF MAINTAINING CONTACT WITH METAL PARTS GAP OPERATING TO MEOP
    - BENCH TESTING SHOWED CAPABILITY TO MAINTAIN O-RING CONTACT DURING INITIAL PHASE (0 - 170 MS) OF TRANSIENT

Difficult to read

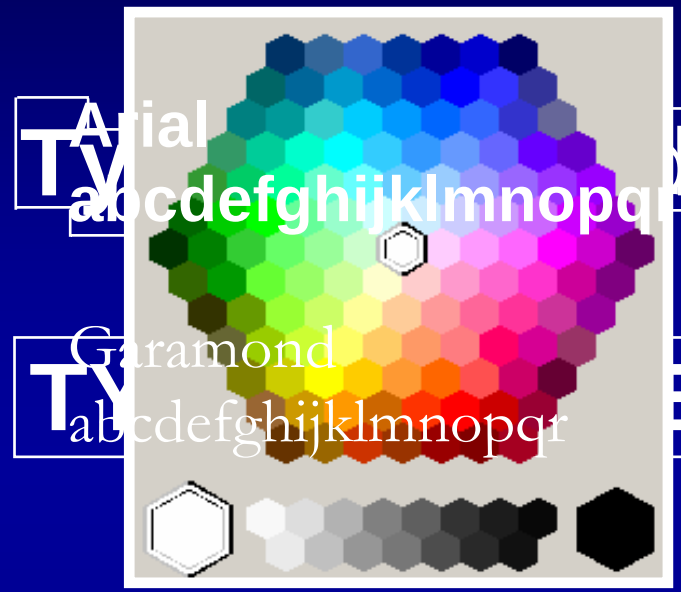


To avoid this error, you need a typography and layout that are easily read

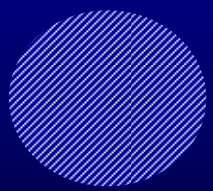
Choose legible type

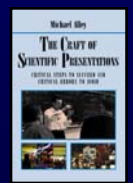
Sans serif type

~~SERIF TYPEFACE~~



Choose a helpful layout





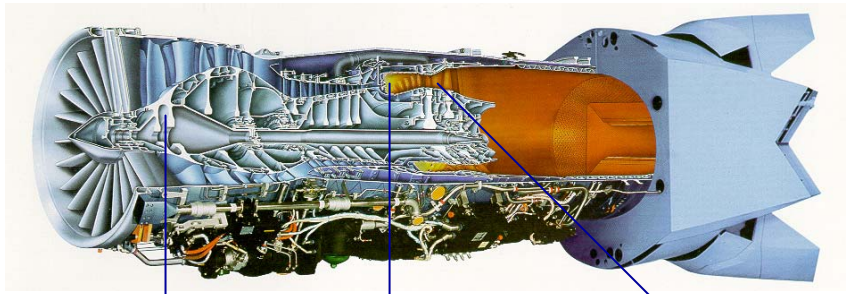
More effective than using PowerPoint's defaults is using a sentence headline supported by images

Sentence Headline

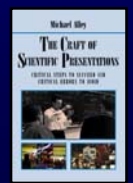
Support in Body

The sentence headline succinctly states the main assertion of the slide

Body supports with images



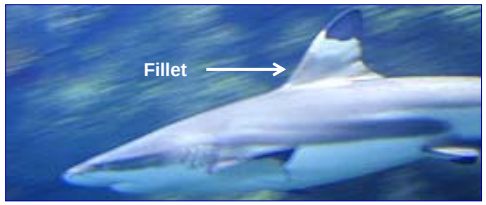
Body supports with needed words



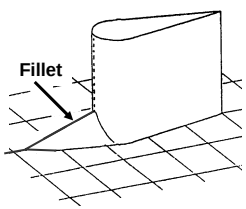
Four criteria are important in evaluating a layout design for presentation slides

Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark



Fillet on Seawolf submarine



[Devenport et al., 1991]

Virginia Tech

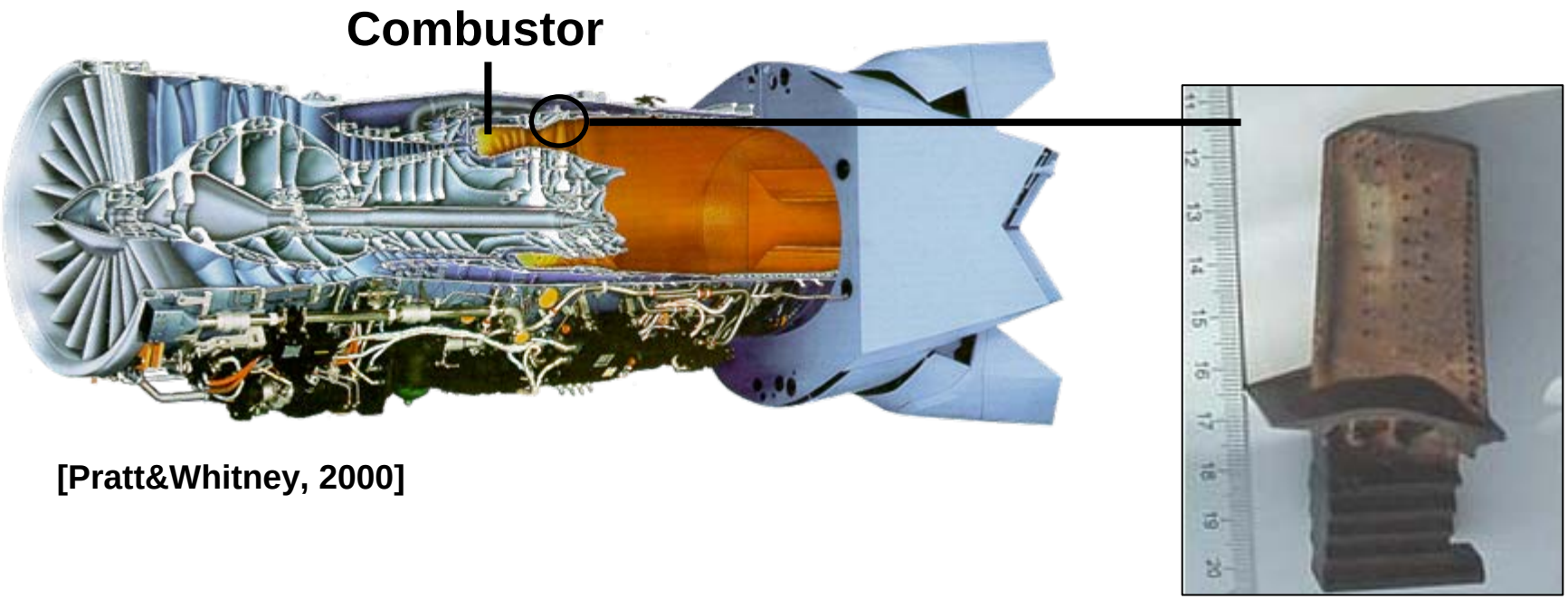
How memorable is the design?

How many slides does the design require?

Does the design help the slides stand as notes?

How effective is the design in an argument?

Our goal is to test a fillet design for turbine blades and vanes downstream of the combustor



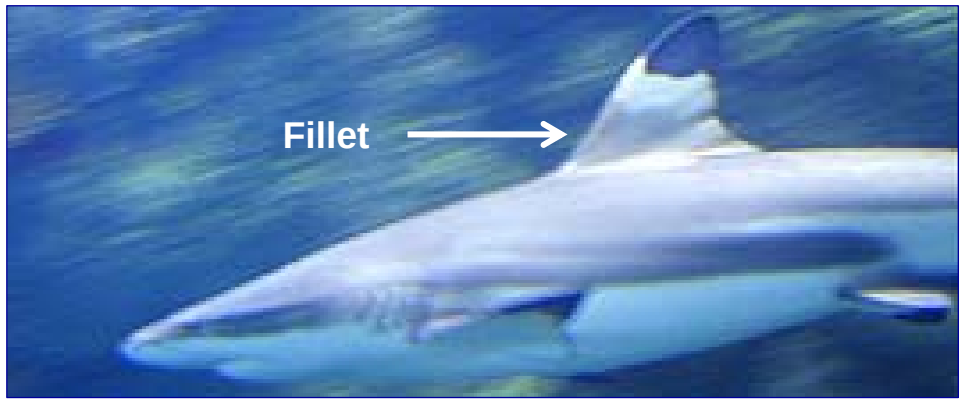
[Pratt&Whitney, 2000]

The purpose of the fillet design is to reduce vortices that disrupt the film cooling of the blades and vanes

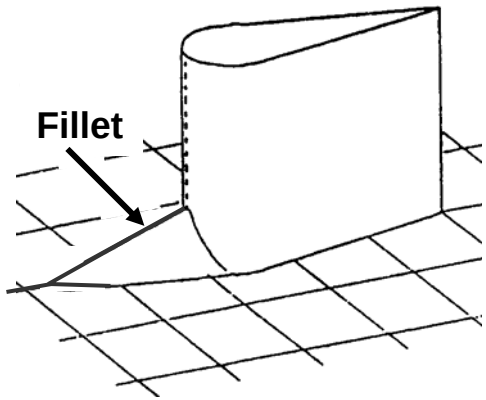
Virginia Tech

Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark



Fillet on Seawolf submarine



[Devenport et al., 1991]

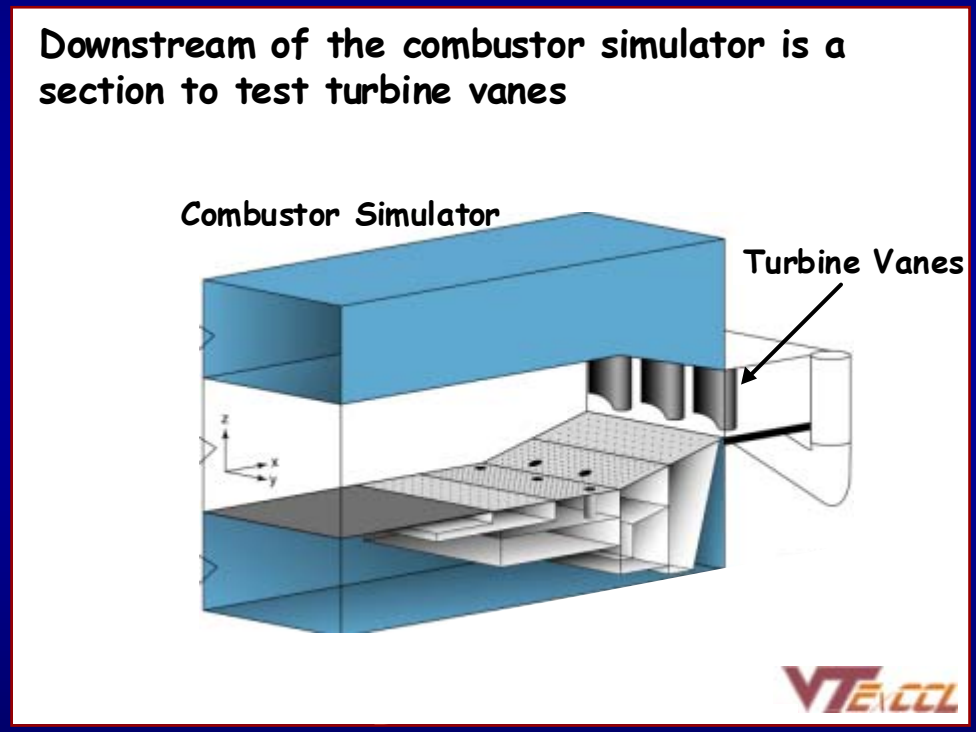
Virginia Tech

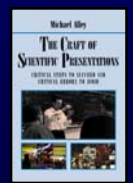
Use a headline that succinctly states the purpose or assertion of the slide

A strong headline—

identifies the slide's purpose for the audience

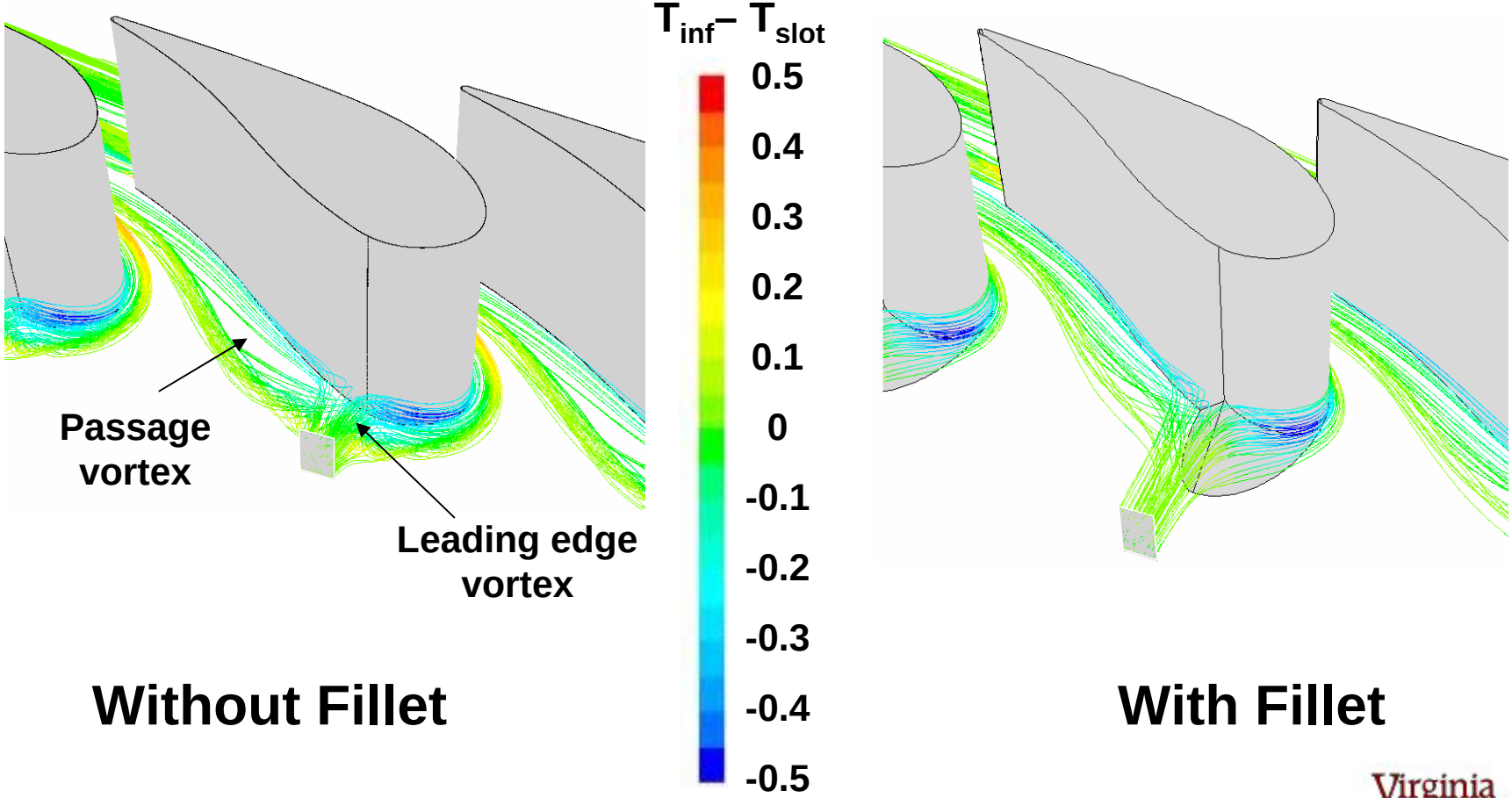
identifies the slide's purpose for the speaker





Results

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



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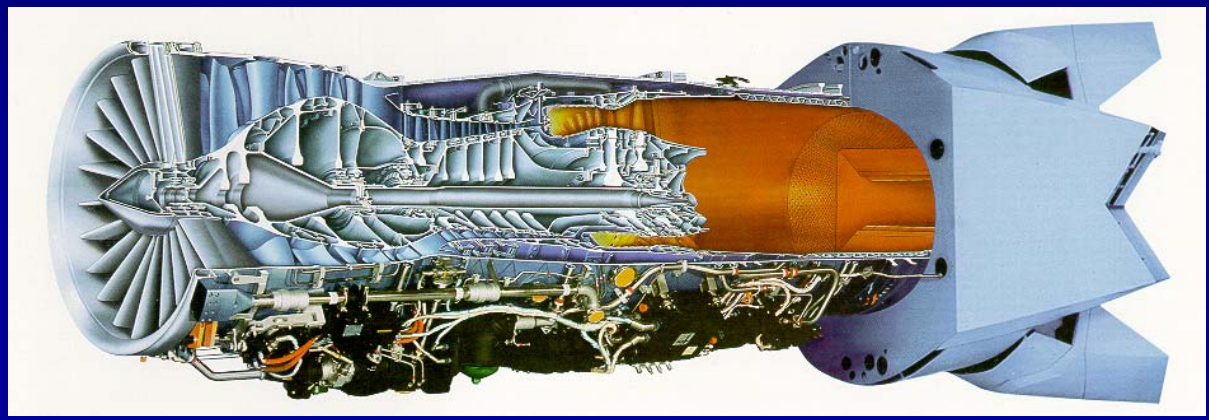
The body of a slide should support the headline with images and words

Supports with images



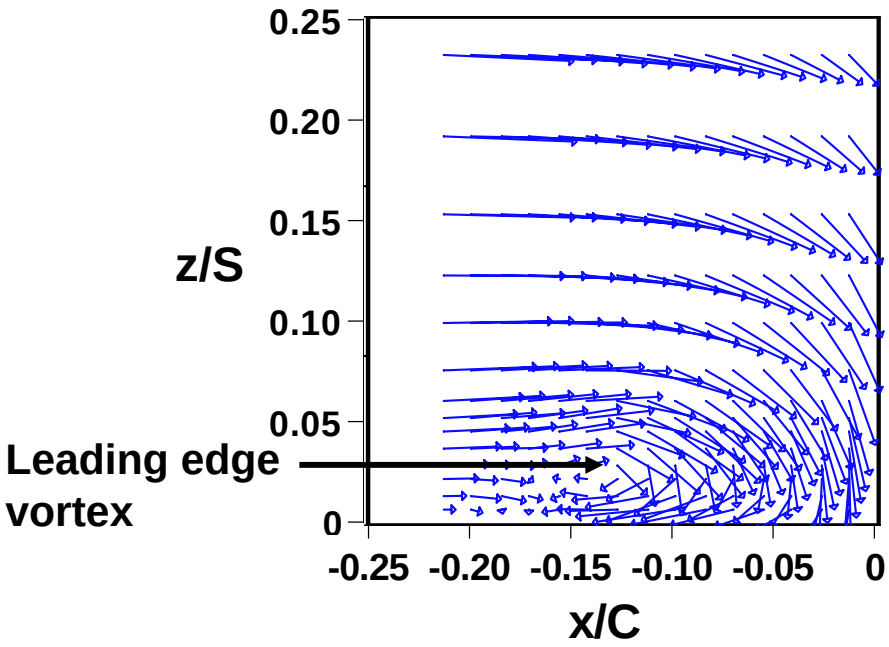
Supports with necessary words

clear

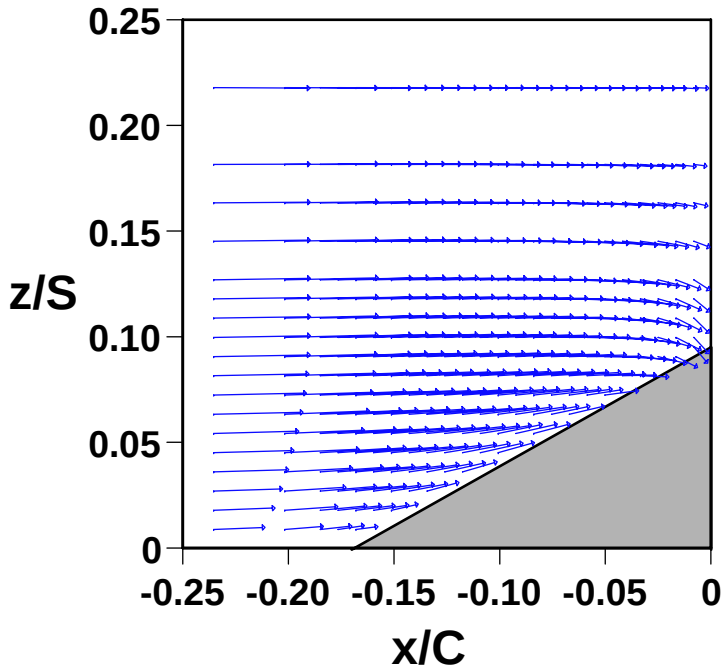
familiar

concise

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



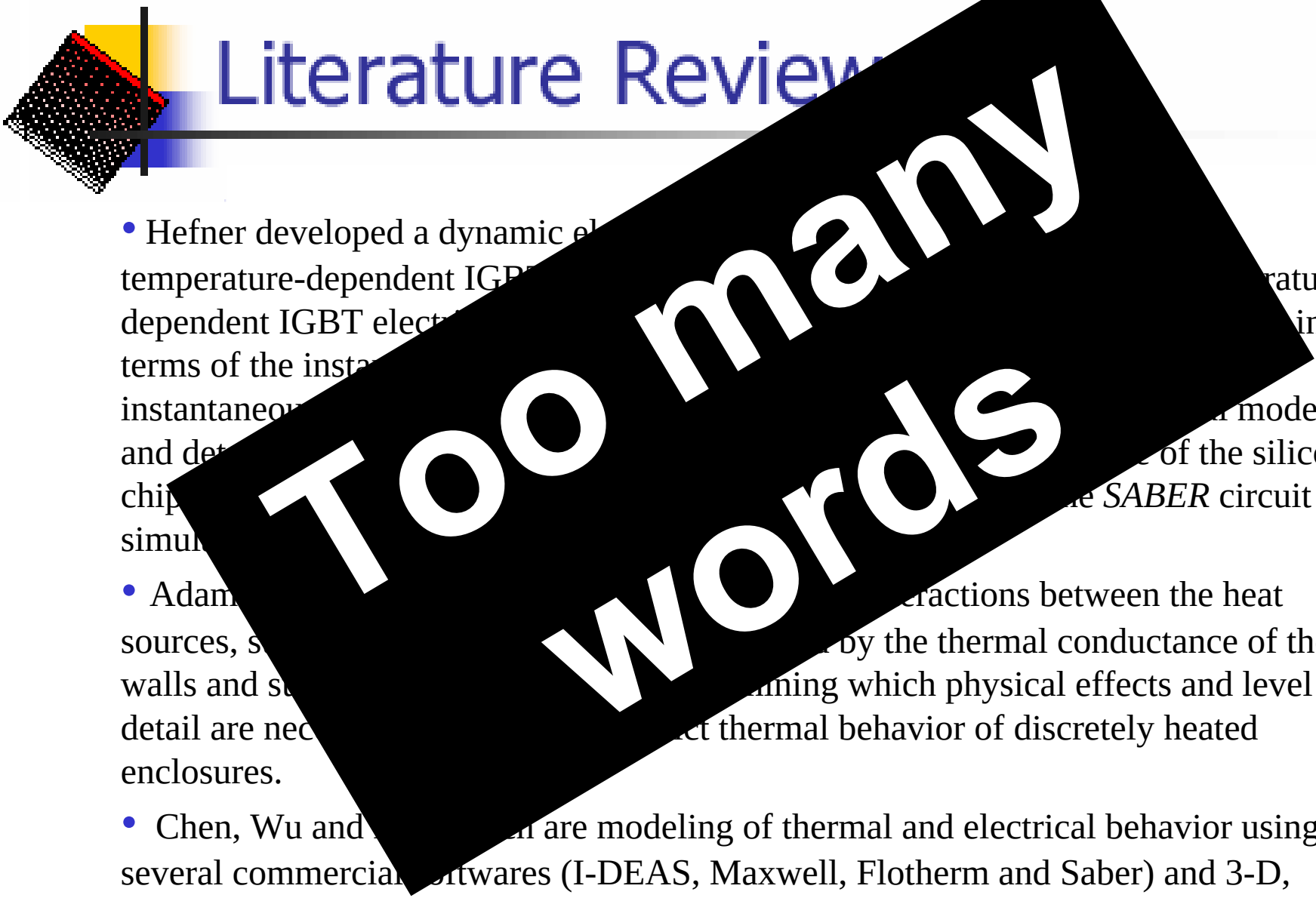
Velocity profile:
vane without fillet



Velocity profile:
vane with fillet

Virginia Tech

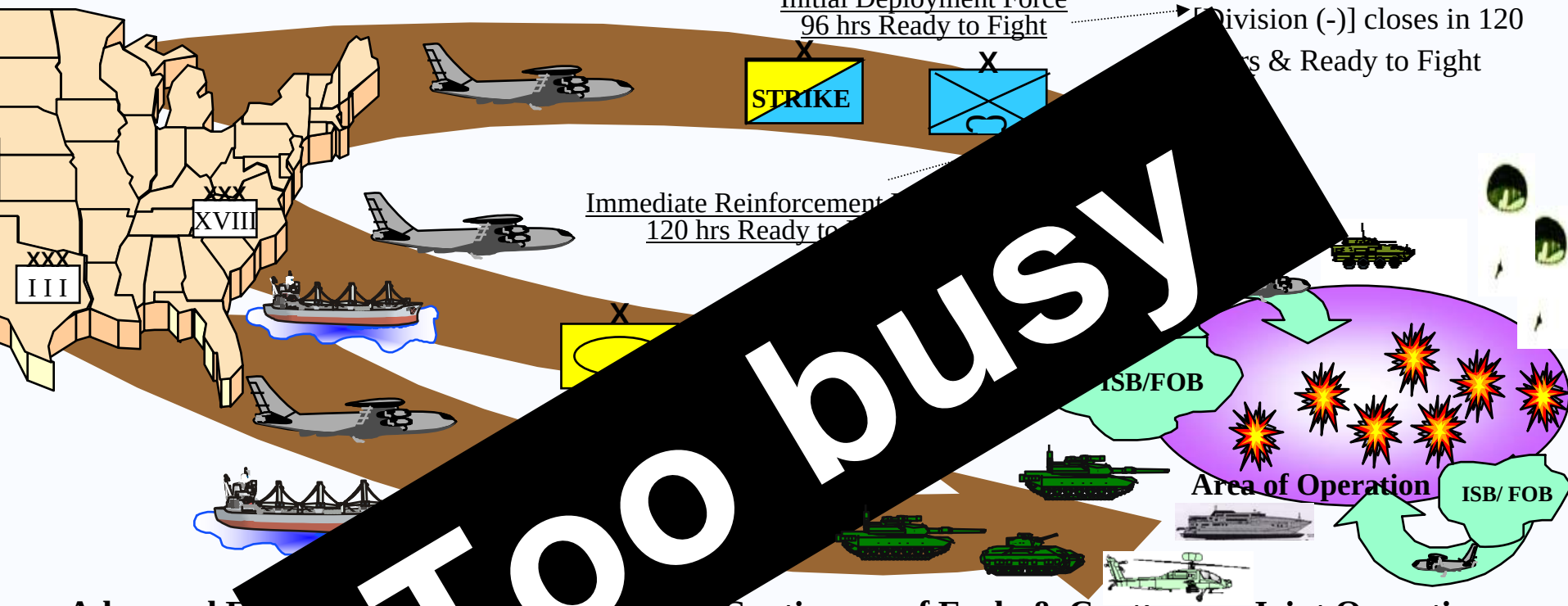
Literature Review



- Hefner developed a dynamic el… temperature-dependent IGB… rature-dependent IGBT elect… in terms of the insta… instantaneou… model and det… of the silicon chip… e *SABER* circuit simul…
- Adam… eractions between the heat sources, s… by the thermal conductance of the walls and s… ining which physical effects and level of detail are nec… ct thermal behavior of discretely heated enclosures.
- Chen, Wu and … are modeling of thermal and electrical behavior using several commercial … twares (I-DEAS, Maxwell, Flotherm and Saber) and 3-D, transient approaches.

Joint Force Projection Concept/Requirement -- AXXI

Enabling Strategic Maneuver - (Circa 2010)



Advanced E **Continuum of Early & Continuous Joint Operations**

CONTI **ERATIONS** **EXTENDED OPERATIONS**

Missions:
- •Strat
- •Preve ive
- •Shape c cisive Ops

Missions:
- •Sustained, decisive ground operations
- •Conflict Termination on US dictated terms

Deployment Require ilestones:

C+ 96 hrs | C+ 120 hrs | C+30 days | C+60 days

Initial Deployment Contingency Response Force (Air)--Ready to fight in 96 hours
- Two Brigade Task Force (Division minus)
- Mission tailored
- Subordinate to JTF
- "In-stride" coordination & team building

Immediate Reinforcement Force (Air)-- Ready to Fight in 120 hours
- Armor/Mech Brigade TF w/support & Strike Force
- Mission tailored
- "Plugs" into Initial Deployment Force HQs
- Joint Force support

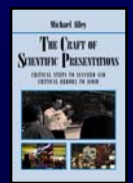
Campaign Forces: Corps w/ 3 Divisions (+) (Sea/Air)--Ready to fight by C + 30
- Mech/Armor/Inf Division mix
- Capable of conducting sustained, decisive operations as part of Joint Force
- •Follow-on Forces (E - Bdes & an additional divisions as required)

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

Presentation Outline

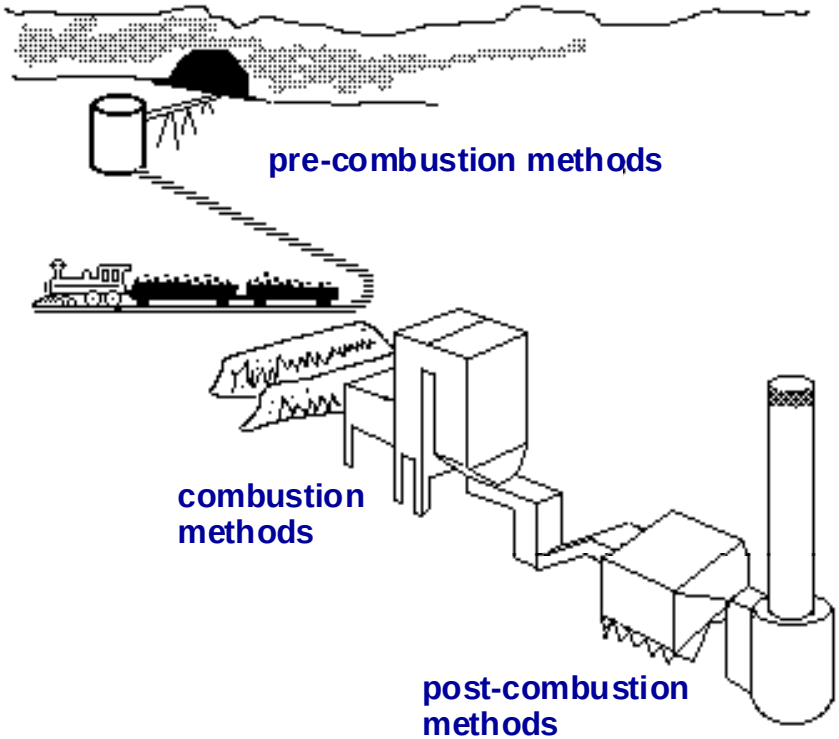
- Introduction
- Background
- Pre-Combustion Methods
  - –coal switching
  - –coal cleaning
- Combustion Me
  - –atmos ed bed
- Po Methods
  - –a ion
  - –absorption
- Conclusions
- Questions?

Not memorable



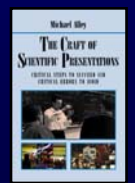
To make slides memorable, you have to consider what to include and what to exclude

This presentation compares several methods for reducing emissions of sulfur dioxide



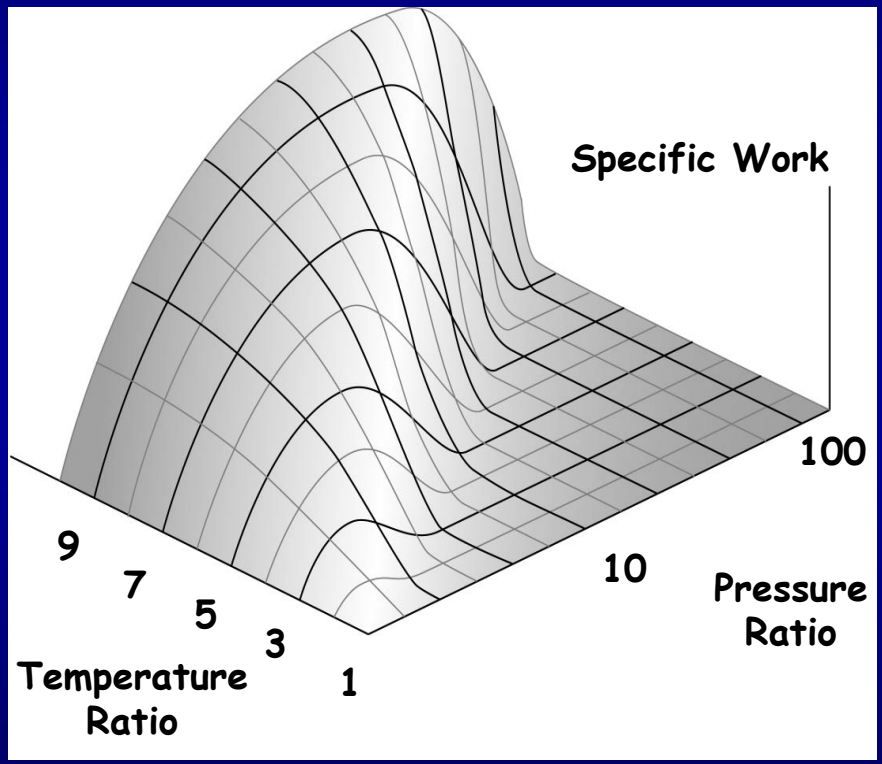
What to include

What to exclude

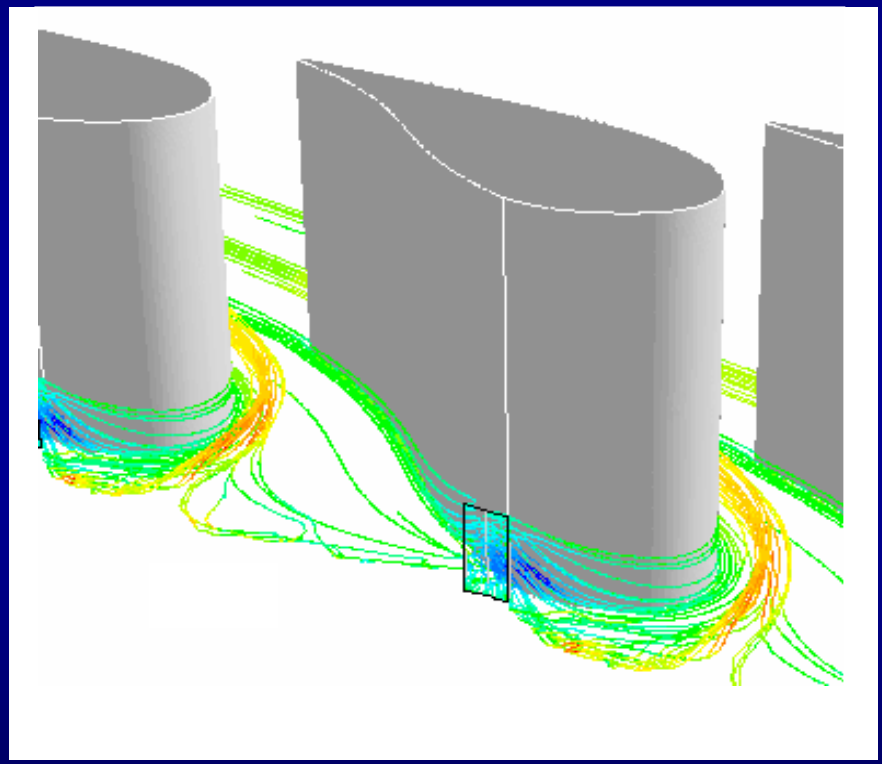


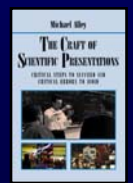
Slides should include key results and images

Results



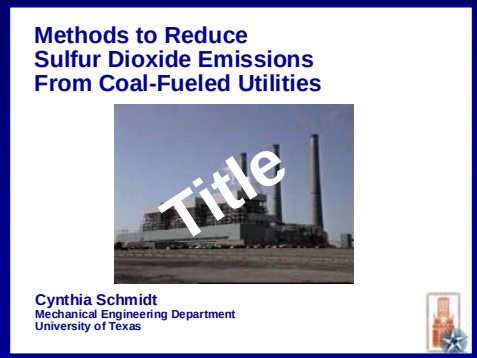
Images

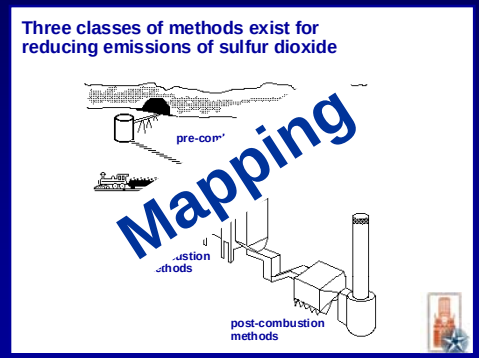




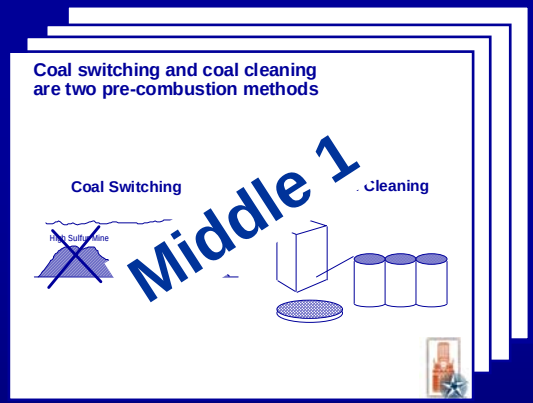
Slides should also include signals for the presentation's organization

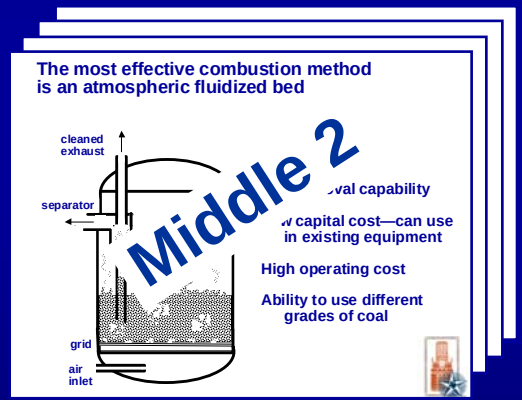
Beginning



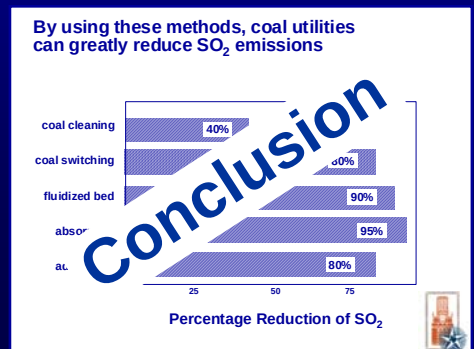


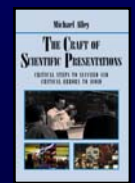
Middle





Ending





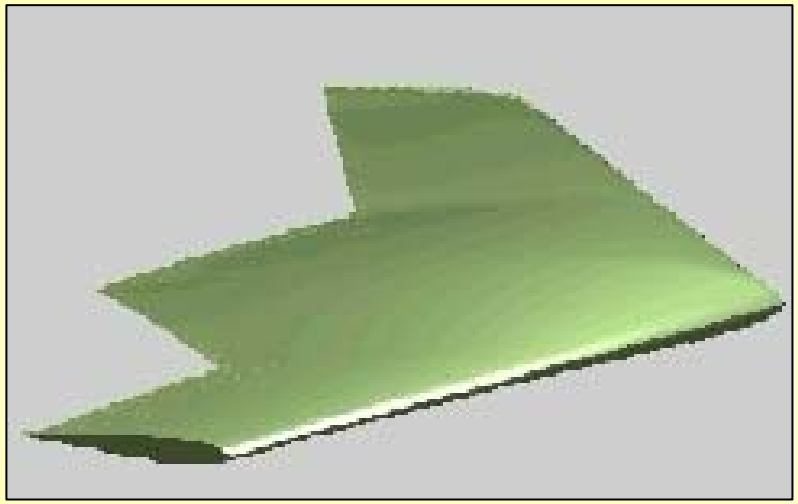
Computational Analysis of the Aerodynamic Ener
Required of Morphin

Needs image to orient

Greg F **J. Inman**
Center for **tructures**
Air Force O **49620-99-1-0294)**

CIMSS

Computational Analysis of the Aerodynamic Energy Required of Morphing Wings



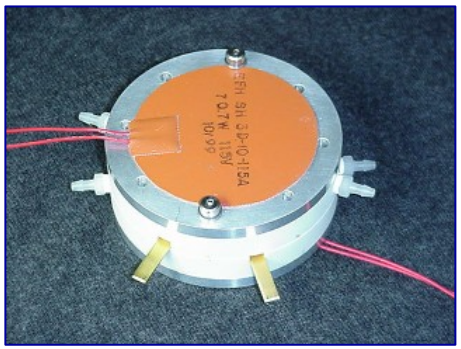
Greg Pettit, Harry Robertshaw, and Daniel J. Inman

Center for Intelligent Materials, Systems and Structures

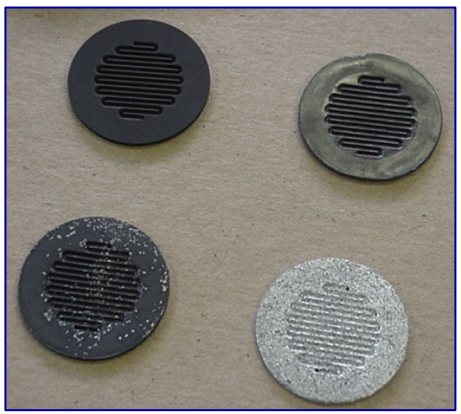
Air Force Office of Scientific Research (F49620-99-1-0294)

CIMSS

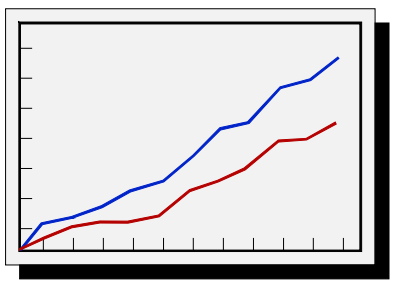
This presentation evaluates composite materials for the bipolar plates of fuel cells



Role of bipolar plates in fuel cells



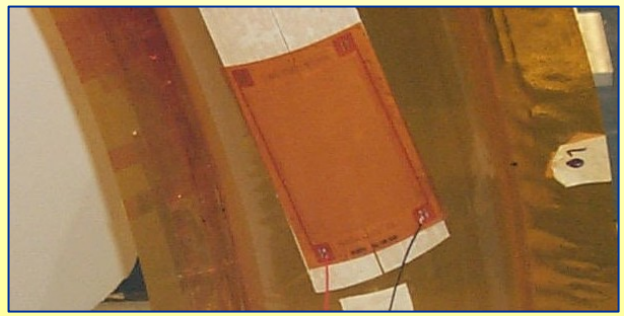
Comparison of bipolar plate materials



Evaluation of bipolar plate performance

Virginia Tech

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



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

CIMSS

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?


Missed
Opportunity?

Review of Test Data Indicates Conservatism for Penetration

- The existing SOFI on tile t… …ate Crater was reviewed along w… …search data
  - Crater overpredic… significantly
    - Initial… …y
      …00ft/sec for
      …e softer SOFI particle
      … tile coating
      …t it is possible at sufficient mass
      … tile is penetrated SOFI can cause …mage
  - Fl… …dition is significantly outside of test database
    - …lume of ramp is 1920cu in vs 3 cu in for test

Too many levels of detail

Force Structure--Why Change?

Because we have too much to throughput

1 Vehicle ever[y]
39 Second[s]
18[0]

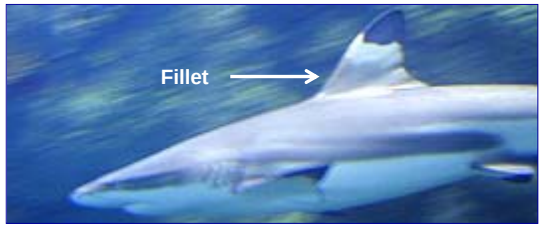
[1] Vehicle every 4 seconds in peak period

Distracting

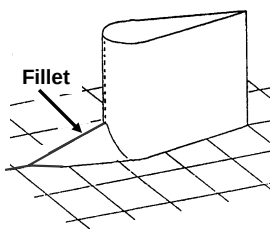
In summary, the slide design given here is much stronger than PowerPoint's default design

Fillets reduce leading edge vortices in nature and in engineering

Fillet on dorsal fin of shark



Fillet on Seawolf submarine



[Devenport et al., 1991]

Virginia Tech

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

Free Templates: http://writing.eng.vt.edu/slides.html