Opening Remarks

John Vassberg

27th Applied Aerodynamic Conference
San Antonio, TX
20-21 June, 2009
4th AIAA CFD Drag Prediction Workshop

Organizing Committee

Tom Zickuhr, David Levy
Cessna Aircraft

Dimitri Mavriplis
U. of Wyoming

Olaf Brodersen,
Bernhard Eisfeld
DLR

Rich Wahls, Joe Morrison
NASA

Mitsuhiro Murayama
JAXA

John Vassberg,
Ed Tinoco, Mori Mani
The Boeing Company
DPW-IV Objectives

• Provide Impartial Forum To Evaluate RANS Solvers
• Identify Areas Needing Research & Development
• Conduct Blind Test of State-of-the-Art CFD Methods
  ▪ Follow-Up Wind-Tunnel Tests After Workshop
• Document Results
  ▪ Available on DPW-IV Website After Workshop
  ▪ AIAA Papers for Chicago Summer 2010
• International Representation:
  ▪ Industry, Academia, Gov’t Labs & Commercial Vendors
Participation Demographics

- Total Participants: 19
- Total Solution Sets: 29
- USA: 37%, Europe: 37%, Asia/Russia: 26%
- Industry: 26%, Gov’t: 32%, Univ: 11%, Vendors: 32%
- Structured: 47%, Unstructured: 53%
- Returning From DPW-III: 47%, New To DPW-IV: 53%
Case 1a: Grid Convergence Study

Single Point Grid Sensitivity Study on Four Grids

- CRM Wing-Body-Horizontal Configuration
- Mach = 0.85, $C_L = 0.5 \ (\pm 0.001)$, Re = 5 million
- Tail Incidence: $iH = 0^\circ$
- Coarse, Medium, Fine Meshes Required
- Extra-Fine Mesh Is Optional
Case 1b: Downwash Study

Four Drag Polars on Medium Grid

- CRM Wing-Body ± Horizontal
- Mach = 0.85, Re = 5 million
- Alpha = 0.0°, 1.0°, 1.5°, 2.0°, 2.5°, 3.0°, 4.0°
- Tail Incidences: -2°, 0°, 2° & No Tail
- Derive A Trimmed Drag Polar
- Derive Delta Drag Polar:
  - Tail Off vs. Trimmed
Case 2: Mach-Sweep Study (optional)

Three Drag-Rise Curves on Medium Grid

• CRM Wing-Body-Horizontal (iH = 0°)
• \( C_L = 0.40, 0.45, 0.50 \) (±0.001)
• Mach = 0.70, 0.75, 0.80, 0.83, 0.85, 0.86, 0.87
• Re = 5 million
Case 3: Reynolds Number Study (optional)

Single Point Solution on Medium Grid

- CRM Wing-Body-Horizontal (iH = 0°)
- Re = 20 million
- Mach = 0.85
- $C_L = 0.50$ (±0.001)
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Agenda

Saturday, 20 June, 2009 (8:30-5:30)
• Overviews: Geometry, Grid, Test Plans
• Participant Presentations (Sessions 2-6)

Sunday, 21 June, 2009 (9:00-4:00)
• Participant Presentations (Sessions 7-8)
• Invited Presentations
• Summary of CFD Results
• Open Discussion & Next Steps
4th AIAA CFD Drag Prediction Workshop

Agenda

Wednesday, 24 June, 2009   (2:00-5:00)
- DPW Follow-On Studies
- 103-APA-22
- Room Travis D
- Session Chairs: Ralf Rudnik & Mori Mani
- Presentations:
  - 5 Publications
  - 1 Summary DPW-IV (Oral)
  - Panel Discussion: Joe Morrison (Host)