NAFEMS Technical Working Group Overview

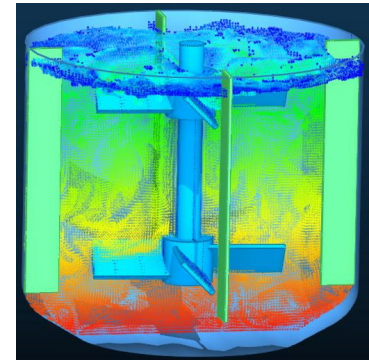## Computational Fluid Dynamics (CFDWG)
2019

NAFEMS

Computational Fluid Dynamics (CFDWG)

- The Computational Fluid Dynamics Working Group (CFDWG) is concerned with all aspects of Computational Fluid Dynamics (CFD), including the flow of fluids (gases and liquids), heat and particulate flows. All computational approaches are included (FVM, FEM, LBM, System-level or 1D-CFD etc.) and the related technologies required whether for pre-processing (including meshing for CFD), solving or post-processing. The group was formed in 1995 to address the needs of the Engineering and scientists using CFD tools. The group comprises nearly 40 members from industry, consultancies, vendors and academia, many of whom have been actively involved for more than a decade.

- In 2016 the working group identified that the Oil and Gas industry often lacked standardised modelling approaches and the Oil and Gas focus group was formed and operates under the remit of the parent CFDWG. The Oil and Gas Focus group is currently developing guidance in the areas of atmospheric dispersion, helideck environment, natural ventilation assessment and fire modelling.

- The CFDWG meets approximately every 6 weeks online via WebEx, plus at least 1 face-to-face meeting each year, often coinciding with an event.

- **CFDWG Chair** – *To be appointed*
- **Oil and Gas Focus Group Chair** – Steve Howell, Abercus
- **CFD Journal Editor** – Don McGlinchey, Glasgow Caledonion University

- The group includes representatives of Abercus, ac&e, Airbus, ANSYS Inc., Bergische Universität Wuppertal, Boeing, BP, Cambridge Consultants, Cambridge Flow Solutions, Caspus, CD-adapco, Doosan-Babcock, ESI, FLUIDS & C^O, Ford Motor Company, Frazer-Nash, GE Power, Glasgow Caledonian University, Health and Safety Executive, Infomec, Widener University, Jaguar Land Rover, Lea CFD Associates, Marine Engineering Consulting, Mentor Graphics, MMI Engineering, Norton Straw, Quesada Solutions, Rolls-Royce, University of Oxford, 8020 Engineering

- Information about the Computational Fluid Dynamics Working Group can be found on the NAFEMS website at **www.nafems.org/community/working-groups/computational-fluid-dynamics**

- To enquire about joining this working group complete the online form at **www.nafems.org/community/working-groups/computational-fluid-dynamics/get_involved**

Computational Fluid Dynamics (CFDWG)

Current CFDWG Activities:

- The CFDWG like to have a lot of activities on the go. They have a considerable number of publication in progress with "The Designers' Guide to CFD" and an introductory guide "What is Systems CFD?" out imminently.

- Other publications that are in development include "How to Model Radiation", "Why to Heat Transfer with CFD"), "Industrial Validation for CFD" and "How to Model Rotor Aerodynamics".

- "Finite Element Analysis for Engineers – A Primer" has long been a flagship publication for NAFEMS and the CFDWG is currently developing a complementary publication aimed at providing Engineers getting to grips with analysis in the fluid domain with a practical textbook.

- The CFDWG is helping to introducing engineers to advanced techniques by providing a series of introductory flyers. The group are currently developing "What is Multispecies CFD?", "What is Turbulence Modelling?" and "What is Multiphase FlowCFD?" pamphlets.

- The first volume of the NAFEMS International Journal of CFD Case Studies was published in 1998 and is still going strong with Volume 12 currently in production.

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Recent CFDWG Outputs:

- The CFDWG have recently released a publication discussing the advantages and disadvantages of 3D CFD when compared to 1D Systems Simulation.

- NAFEMS has a long history of producing benchmarks that can be used by developers and end users to demonstrate the quality of software codes. There is a substantial library of benchmarks in the structural domain and it was fantastic to recently have the first in series of benchmarks aimed at simulation in the fluid domain.

- The CFDWG regularly supports the activities of our Regional Steering Committees by organising technical seminars. Recent CFDWG seminars include "A Guide to High-Fidelity CFD for Industry" and "A Guide to Hybrid RANS-LES Methods: Industrial Examples and Theory".