

Terms of Reference for the NAFEMS Multiphysics Working Group

Industrial use of Multiphysics simulation is a diverse and challenging topic. The main driving force is the need for more realistic numerical simulations which leads to solving coupled problems, supported by continuing improvements in hardware and software. Some problems can only be solved by means of Multiphysics simulations. One of the most important aspects is the coupling of physics. In this context smart reductions, like e.g., coupling of 1D submodels with 3D submodels, are of vital importance.

The NAFEMS multiphysics working group (MPWG) has been set up to promote and support the use of multiphysics simulations in industry.

Aims

Knowledge Transfer

The challenge with multiphysics simulations is the sheer amount of knowledge that the simulation engineer needs to possess. To address this, the MPWG works with:

- Publications (books and papers)
- Webinars
- Conferences and workshops

Benchmarks and Case Studies

Due to the lack of published material, the MPWG strives to create a collection of case studies and benchmarks for coupled simulations.

Research

Given the complexity of multiphysics applications, a lot of research still needs to be done. The MPWG promotes collaborations between universities, software vendors, and industry. The group encourages the establishment of industrial consortia for addressing difficult simulation challenges.

Working Group Byelaws

1. Members are listed on minutes as attending, contributing, apologies or no communication. The NAFEMS Technical Officer is considered to be a member of the working group.
2. Contributions include:
 - a. attending and actively participating in working group meetings,
 - b. sending relevant comments or reports on agenda items to the chairman in good time for the meeting,
 - c. volunteering for and carrying out actions arising from the meetings,
 - d. significantly participating in discussions or other activities on the NAFEMS MPWG Google Group
 - e. carrying out reviews of journal papers.
3. If a member does not contribute for more than 9 months, they will be warned their membership of the working group may be terminated. This will happen after 12 months of non-contribution at the discretion of the chairman.
4. Potential new members should submit a CV to the chairman indicating their knowledge and experience of industrial analysis related to the working group. This will be reviewed by the

group and if approved the person will be invited to two meetings or for a maximum of 6 months access to WG Google Group after which both they and the group can decide to invite full membership or walk away.

5. At least two thirds of the working group membership shall consist of current NAFEMS members. A check on the consistency of the working group will be made following submission of the NAFEMS annual report.
6. At the discretion of the chairman, participation in the working group can be split between up to three people from the same organisation.
7. If a member is unable to attend a meeting, they may send a colleague in their place to make their contributions. That person would be recorded as a visitor.
8. The position of chairman is open for review every 3 years on the anniversary of the initial appointment. There is no requirement for the role to be rotated. Only established members of the working group may vote.
9. The chairman should aim to circulate an agenda to the working group a minimum of one week prior to the upcoming meeting
10. The working group should aim to meet a minimum of four times per year
11. Minutes will be taken typed up and circulated within two weeks of the working group meeting
 - a. on a rotating basis by a scribe selected from the group and agreed in advance
 - b. by the chairman or an individual nominated by the chairman.
 - c. by a NAFEMS representative