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Summing up from Work Session 1-5

**WS3: System design, construction,
reliability & safety**

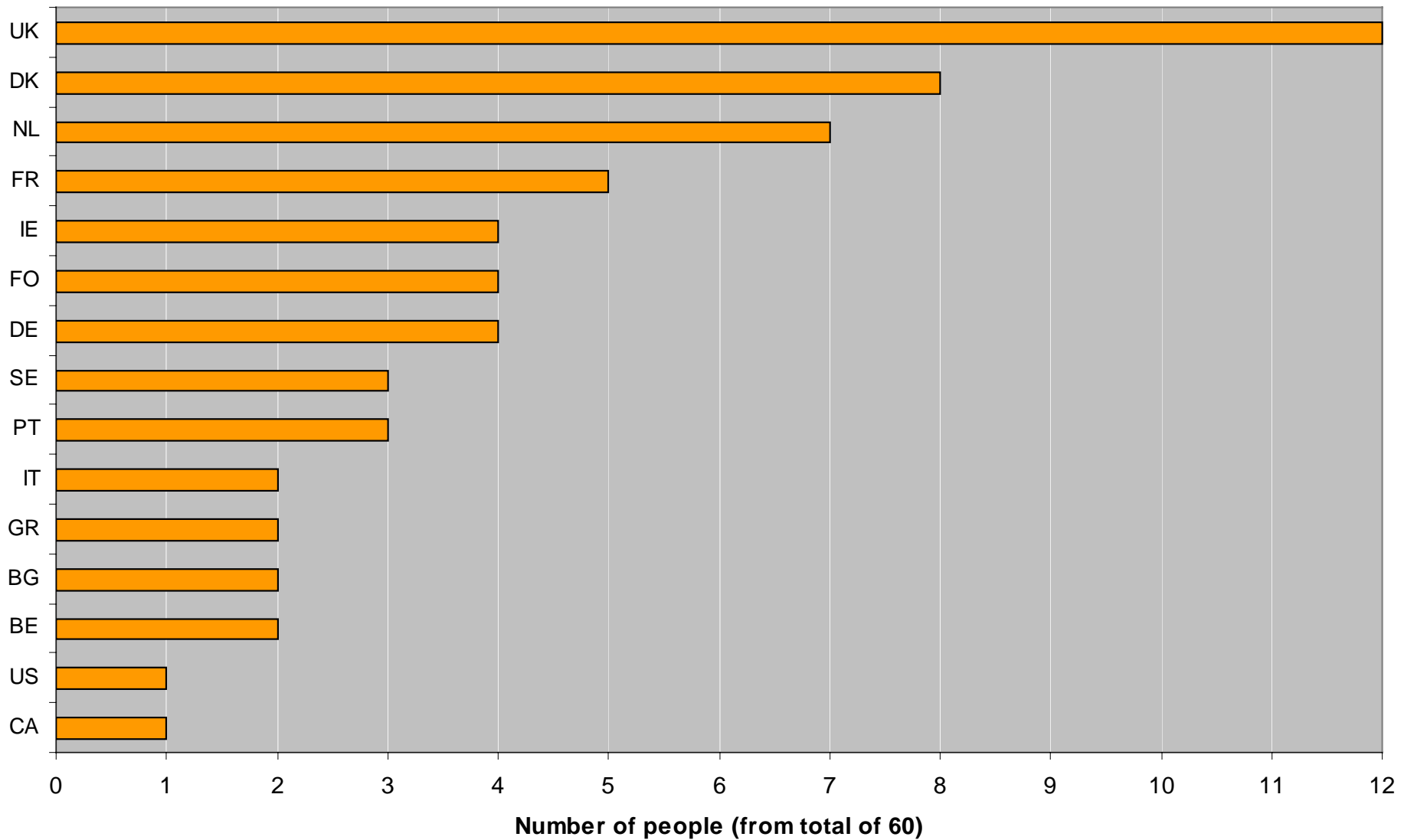
Peter Scheijgrond
26th April 2007

Interaction!

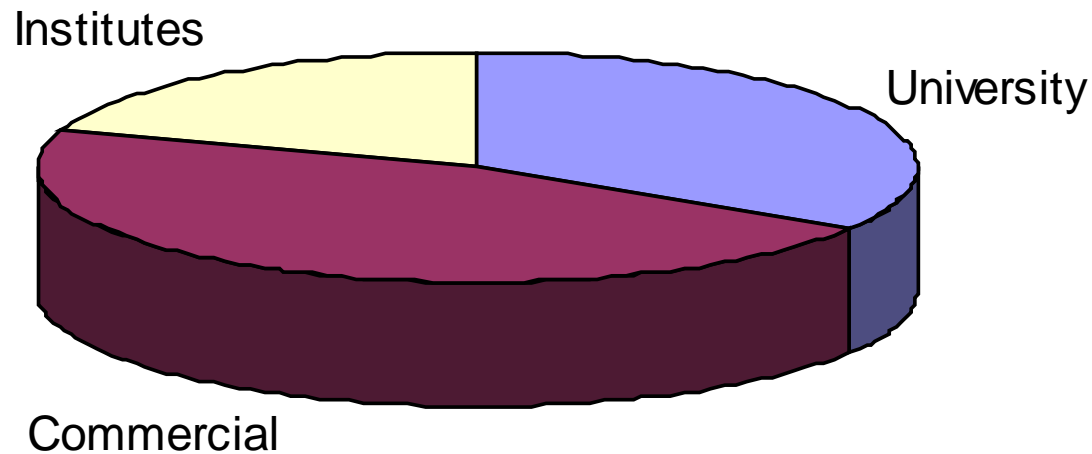


Statistics

- >50 participants.
- 27 presentations
- Speed dating using “NEEDS and OFFERS”
- Discussion groups on Guidelines (3 groups)
- Exercise in Failure Modes Effects Analysis (FMEA) (5 groups)
- Plenary Workshop Evaluation
- 5 invited speakers: Diederik Samsom (PvdA), Claudio Bittencourt Ferreira from DNV, Kimon Argyriadis from Germanische Lloyd, Rod Hacker from Halcrow and Jan van der Tempel from TU Delft.



Mix of Participants



Discussion group

- Blue Water
- Ponte Di Archimedes
- Ecofys
- Engineering company Eric Rossen
- SNAIL/Edinburg University/ EMEC
- Owens Corning











SEWAVE

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Task 3.1 Verification of design codes and structural reliability

- Guidelines on design and operation of wave energy converters, DNV, 2005
- DNV Offshore Service Specification (OSS-312), 2006
- Guideline for the Certification of Ocean Energy Converters, Part 1: Ocean Current Turbines, Germanischer Lloyd, 2005

Task 3.1

Differences between system design philosophies reflected in offshore codes and wave device design:

- Need for **adaptive** guidelines!
- Consequence of failure is much smaller for a wave device that is normally unmanned, then for an offshore manned platform.
- Standard equipment in a WEC device may be subject to different loads and thus consideration of dominant failure modes should be made.

Task 3.1: RTD needs

- Consensus on (Adaptive) guidelines
- Measurement campaign -> Learning from experience (building data bases of experiences, flow fields and loading cases)
- Reliability of standard components - tools for determining component reliability

Task 3.2 Production and construction methods

- Training of developers by offshore construction industry
- Gaps in material research, corrosion, durability, fatigue loading etc
- Research into production time scales. Oil rigs take 2 years to built!
- Early consultation of offshore parties

Task 3.3 Deployment and maintenance procedures

- proprietary component failure, including considerations on moorings, durability of materials and corrosion.
- remote operation, remote fault diagnostic, and condition monitoring will be essential in a production device.
- Develop Monte Carlo models for reliability & availability of wave farm
- Influence of insurance guidelines (more simulation of installation, avoid over design)

Task 3.3 Deployment and maintenance procedures (2)

- Collaboration between industries
- Training by offshore experts of developers
- Early consultation to avoid design errors