ERCOFTAC : Oil and Gas, 20-21 April 2016, Kongsberg, Oslo, Norway

Modelling & Simulation – Best Practices & Technology Trend

Coordinators:

Dr. Richard E. Seoud (ERCOFTAC), & Mr. Per Kjellgren (Kongsberg)

Background:

This 2016 seminar comes in a period where oil prices have been on the decline since June 2014, due to several factors, from the impact of Shale gas, economic slump in major emerging markets, to excess availability of low cost oil out of the Middle East. The aforementioned, imply the oil price will remain in a band, governed by an upper limit -Shale gas, and a lower limit- Middle East oil. Critically, this price band impacts strongly the producers and subsequently solution providers, with a particular view to Deepwater operations, resulting in major delays and push out development times, for new discoveries. However, when considering Subsea tiebacks, it should still support an economically viable position **in marginal and mature fields**. Still, the industry as a whole has to navigate from current conditions. Therefore, our aim, here, is to technologically navigate practicable advances, in this energy sector, with a view to sustainable and viable operations.

 Thus, this particular energy sector has to re-think its approach, if it is to weather the status-quo, and lest we forget the carbon footprint, and the growing competitive technology march from renewables. This is where digitisation of the entire upstream-downstream process can lead to significant improvement in revenues , cash-flows least of all operational excellence. Critically, CFD-FEM has a huge role and opportunity to play in that system, in further alleviating CAPEX and OPEX economics, in attaining a balanced technology portfolio, leading to the rapid deployment of proven cutting-edge technologies, from R&D to the operational environment.

Thus, the seminar will focus on matters pertaining to recent advances in:

Multi-phase Flows, Subsea Operations, Real-Time Simulations, Risk Analysis and Safety , and Machine Design (tbc).

 In addition, a round table discussion will take place on the afternoon of 21st, to discuss the delivery of an ERCOFTAC Bulletin – O&G Theme, Sep 2017.

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|  | 20 April 2016  Introduction  Multiphase Flow Systems,  Risk & Safety |  |
| 8:15-8:40 | Coffee & Registration |  |
| 8:40-8:50 | Welcome & Introduction | Dr R Seoud, Mr P Kjellgren |
| 8:50-9:40 | Resolving the O&G flow assurance challanges:Useful simulations of system evolution- the need for a pragmmatic multi-level modelling approach | Prof. S T Johansen, SINTEF |
| 9:40-10:10 | Wining a H2020 project’ | Dr. F Chowdhury, Technovate |
|  | **Multiphase Flow Systems** |  |
| 10:10-10:50 | Multiphase Flow Characterisation and Summary of Numerical Methods’ | Prof. M. Sommerfeld, Halle-Wittenberg |
| 10:50-11:20 | Refreshments |  |
| 11:20-12:00 | Modeling FCC Units - Effect of Particle Size  Distribution using CFD Simulations | Dr. S. Khanna, BP |
| 12:00-12:40 | Overview of the current CFD Multiphase Flow for Subsea and Future Development for Supporting Digital Application | Dr. E Gharaibah, GE |
| 12:40-13:20: | Lunch |  |
| 13:20-14:00 | 1D models for gas liquid slug flow | Prof. O. J. Nydal, NTNU |
| 14:00-14:40 | Euler/Lagrange method for dispersed multiphase flows with technical applications’ | Prof. M Sommerfeld |
| 14:40-15:20 | Assessment of polymer mechanical degradation using computational fluid dynamics (CFD) - Application to Enhanced-Oil recovery (EOR) | Dr. P. S. Imrani, TNO |
| 15:20-15:40 | Refreshments |  |
|  | **Risk & Safety** |  |
| 15:40-16:10 | Determining structural design loads by using CFD to simulate explosions within a probabilistic framework – current best practice and future trends | Dr. S. Howell, Abercus |
| 16:10-16:50 | Mitigating the risk of flow induced pulsations damaging subsea manifolds | Dr. C. Wood, Frazer-Nash |
| 16:50-17:30 | Application of Industry Guidelines, CFD and frequency domain analyses to assess flow induced vibration risk in pipework’ | Dr. A. Graham, CD-Adapco |
| 17:30-18:10 | Some elements on the probabilistic risk assessment methodology for industrial plants subject to external hazards. | Dr. I. Zentner, EDF |
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|  | 21 April 2016  Subsea Operations,  RT CFD  Roundtable Discussion (O&G Bulletin & EU Project) |  |
| 8:30-8:45 | **Coffee and registration** |  |
|  | **Subsea Operations** |  |
| 8:50-9:30 | Thermal Design Optimization of Subsea Equipment Through Compact Modelling | Mr R. Rouzairol, Forsys Subsea |
| 9:30-10:10 | Flow Induced Vibration in Pipes | Mr. K. Jellgren, Kongsberg |
| 10:10-10:30 | Refreshments |  |
| 10:30-11:10 | Advances in Computational Analysis for Subsea Equipment | Dr. A. Haidari, ANSYS |
|  | **Real-Time CFD** |  |
| 11:10-12:30 | The Potential for Real-time Computational Fluid Dynamics | Dr. A. Revell, U. Manchester |
| 12:30-13:30 | Roundtable Discussion  ERCOFTAC Bulletin 2017 (first iteration)  &  EU Project Collaboration  (capturing views and ideas) |  |
| 13:30-14:30 | Lunch |  |
| Close |  |  |
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