

DRG

Dynaflow Research Group

Flow Assurance

Training Course



For Whom?

- *The training is intended for managers and engineers involved in Flow Assurance*

Goals

- *Improve understanding on flow assurance concepts*

Flow Assurance Training Course

TC-3000-03

The training Flow Assurance is a 3-day training course

Content

The concept of Flow Assurance is about ensuring that fluid flows as intended in a pipe or a well. It relies heavily on well-established sciences like fluid mechanics, thermodynamics, mechanical engineering, chemical engineering, discrete mathematics, automation, and computer science. But even though the sciences are well established, flow assurance is developing very rapidly, and keeping updated on all the latest developments can be a huge challenge.

Advanced flow assurance technology often accounts for very significant cost savings, sometimes even making the building of permanent topside platforms redundant for new offshore development projects by sending unprocessed multiphase flow directly to shore.

Commercially available simulation software tools have played a crucial role in this development, and can be very vital to a project when used correctly. Still, they are not reliable if they are treat-

ed as “black boxes”. It is necessary to have some understanding of what goes on “under the hood”.

This workshop will examine not only the key concepts and theories of flow assurance, but also compare the various simulation tools closely and through various examples, help participants understand the best way to apply these tools into their flow assurance practices.

The course facilitator has recently published two updated books on flow assurance, and a digital version of these books will be given to the participants. Some of the subjects discussed will be drawn from the books, while others will be designed based on exercises and input from the participants.

For Whom?

The workshop offers delegates a valuable opportunity to learn from and seek advice from one of the foremost experts in Oil and Gas Flow Assurance.

With years of experience lecturing and providing

consultancy work in the area Dr. Bratland has accumulated an immense amount of knowledge and experience in dealing with Flow Assurance issues in various part of the world.

Expect to leave this three-day seminar with a clearer understanding of effective flow assurance concepts and strategies, and gain awareness of the latest developments and technological breakthroughs in flow assurance. Challenges arising from deeper offshore oil field developments, longer tiebacks and their effect on pipe flow will also be addressed.

Participants are encouraged to bring with them flow assurance problems and challenges they have come across in their projects and the Course Facilitator will attempt to include them into the discussions as far as it is partial to do so.

This workshop is intended for managers and engineers involved in Flow Assurance Interactive training.

Interactive training

The training is a series of presentations by the trainer, illustrated by means of digital slides including many field examples, and a number of case studies. During these case studies the participants contribute by identifying the potential problem and finding an appropriate solution to the problem by means of reasoning and simple manual calculation checks. The training will be focused on translating theory into practical situations in the field. There is also room for the

exchange of experiences by the different participants.

Results

Benefits of attending this training course:

- Improve understanding on flow assurance concepts.
- Ensure uninterrupted, optimum productivity in oil and gas streams.
- Overcome flow assurance challenges faced in your current projects.
- Enhance knowledge on test and measures vital in flow assurance.
- Compare commercially available simulation software tools most suitable for your project.
- Learn critical skills in managing corrosion and erosion.
- Gain awareness of ongoing developments in flow assurance.
- Examine future possibilities and technologies.
- Present clear guidelines and procedures for implementing flow assurance strategies.
- Increase productivity efficiency and lower service costs resulting from hydrate problems.

The trainer

Dr. Ove Bratland was awarded his PhD in Hydraulic Subsea Control Systems from the Norwegian Institute of Technology in 1985; he has close to 30 years of experience in the petroleum industry as a lecturer, consultant and manager across Europe and Asia, providing countless consulting

and training services to global oil and gas companies like Transocean, BP and Statoil.

Duration and group-size

The duration of the training is 3 full days (\pm 8-9 hours per day). The minimum group-size is 6 participants and the maximum group-size is 10 participants. The training will be organized at the DRG office.

Costs

The training will cost EUR 2.200,= per person excluding VAT. The costs include training material, lunch and refreshments during the training.

Contact

If additional information is required, please contact us by e-mail: info@dynaflow.com or by phone: +31 793615150.

Program outline

DAY 1 – Single-Phase Flow Assurance

- Main phenomena in pipe flow
- A closer look at pipe friction: Nikuradse's friction measurements and Moody's diagram is more than 70 years old and to some extent, outdated. Still, they seem to be the most used tools for pipeline capacity calculations even today. Exercise and discussions: Simulating one of the world's longest subsea gas export pipelines: The Zeepipe from Kollsnes, Norway, to Zeebrugge, Belgium.

DAY 2 – Multiphase Flow Assurance

- Ways of categorizing flow
- Different flow regimes in 2-, 3 and 4-phase flow
- Different sorts of deposits, including hydrates, wax, asphaltene, scales, and particles
- Best Practices, Pitfalls and Key concepts in managing Corrosion and Erosion
- Commercially available flow assurance tools
- Fluid properties
- Slugging and slug control
- Simulation examples: Slugging and LNG examples

DAY 3 – Going Deeper into Flow Assurance Phenomena

- More on the theory behind flow calculations
- Ongoing developments and future possibilities
- How to check multiphase flow results
- Heat insulation
- Simulations
- Discussion on flow assurance challenges faced by delegates in their organizations and what can be done to overcome them

Dynaflow Research Group

“Dynaflow Research Group (DRG) is a world wide well respected consultant. We help our clients solve their most complex and critical technical issues”

Consulting services

We provide engineering consulting services in all aspects of design and analysis for the Petro-chemical industry. Our work often requires a multi-disciplinary approach where we combine expertise in fluid flow behaviour, dynamic oscillations, FEM and stress analysis with sophisticated analysis software to predict system performances.

Training

DRG offers a wide range of training courses such as software training, fiberglass training, dynamics and stress training. Most of these training courses are offered on a regular basis during the year. We also develop customized training programs with our customers fit to their specific needs.

Products

DRG has been developing software for many years, which has resulted in several commercially available software packages such as BOSfluids®, BOSpulse®, Jive and Hades. We also provide technical consulting services, and develop numerical software that can be used in computer simulations and other types of scientific computations.

Research

DRG conducts research on different aspects of pipe-system design and pressure vessels. Most of this research is done in close collaboration with Paulin Research Group and their Houston test facilities (www.paulin.com). Dynaflow Research Group provides support to clients with their R&D to help them continuously improve their products.



Topic specific brochures:

- Consulting Service Series
- Software Product Series
- Training Series

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