## **Reservoir & Production Management 2019**

Tuesday 12. November

| HOUR: | DESCRIPTION:   |
|-------|--|
| 08:30 | Coffee and Registration  |
| 09:00 | <b>Opening and welcome</b><br>Chair of the program committee   |
|       | Business Environment & New Players<br>Chair: Vincent Kretz, ONE-Dyas Norge & Alexander<br>Shadchnev, Schlumberger  |
| 09:10 | Draugen Rejuvenation - the OKEA way<br>Håvard Morset, Okea   |
| 09:40 | <b>Taxation and extraction rates</b><br>Petter Osmundsen, University of Stavanger<br>When designing petroleum taxation, attention is on the sanctioning<br>decision. The tax system should not make projects unprofitable. The<br>presentation is about decisions that are not addressed. The tax system<br>also impacts project design. Cheaper and less flexible development<br>concepts, less pre-drilling and fewer wells lead to lower extraction rates   |
|       | Digitalisation in Reservoir Management   |
| 10:10 | <b>Going Digital - change the industry</b><br>Bjørn Kvanvik, Petoro  |
| 10:40 | Refreshments/networking  |
| 11:10 | The evolution of reservoir modeling on Johan<br>Sverdrup<br>Per Olav Eide Svendsen, Equinor<br>While reservoir modeling plays an important role in subsurface<br>digitalization, digitalization is also changing reservoir modeling. Tech and<br>tools are important, but how we work, how we integrate and how we think<br>is also changing. Keywords are ensemble-based methods, automation,<br>Agile, Lean, transparency, T-shaping, web-apps, open source, APIs, a bit of<br>chaos, some friction and lots of fun.   |
| 11:40 | Digitalisation journey in reservoir<br>management - from promise to performance<br>Alexander Shadchnev, Schlumberger<br>Digital technology promises solutions for the E&P industry, but we need to<br>make them real - fast, scalable, and cost-efficient. No single organization<br>or system has all the answers. We need to break down barriers to deliver<br>the transformational change digital promises. Operators, service<br>companies, developers, start-ups, tech giants - everyone has a part to<br>play. The digital future is about openness and new partnerships, working<br>together, in order to deliver superior return-on-investment, efficient<br>exploration, capital efficient projects and profitable production in our<br>industry. |
| 12:10 | Lunch  |

| HOUR: | DESCRIPTION:  |
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|       | <b>Chair:</b><br>Christian Rambech Dahl, Vår Energi & Kari Nordaas<br>Kulkarni, Equinor   |
| 13:10 | Using Machine Learning for Production<br>Optimization and Chalk Influx Mitigation<br>Johan Hatleskog, Cognite<br>This presentation will showcase how Cognite used Machine Learning to<br>develop and make available data-based recommendation tools and<br>applications for Aker BP's production staff to detect and mitigate chalk<br>influx, enabling increased production efficiency. Leveraging tools for visual<br>inspection, ML, and physics simulators Cognite and Aker BP can detect<br>chalk influx events at Valhall wells in the early stages: Using labeled data<br>to identify low- and high-risk operational regions and giving<br>recommendations about mitigation actions when identifying ongoing<br>events like choke back and adjust gas lift.  |
| 13:40 | Brage Digital Twin<br>Peter Kronberger, Wintershall Dea<br>Digital transformation of existing processes using technologies such as big<br>data, advanced data analytics, machine learning, automation and cloud<br>computing will enable continuous performance improvements within the<br>operational sphere. The application of the technology will link the physical<br>and digital world, providing a digital model of physical assets and<br>processes. It will represent the evergreen, wholly integrated digital asset<br>model - from reservoir to export pipeline. The Brage operations team<br>identified processes with the highest potential for digital transformations<br>during an initial opportunity framing workshop. Based on business needs<br>clear emphasis is in the areas of production & well performance<br>optimization, live-data implementation and handling, as well as database<br>integration and dashboarding. |
|       | IOR / EOR projects  |
| 14:10 | Water Shut-Off with Polymer in the Alvheim<br>Field<br>Kåre Langaas, Aker BP<br>A drilling-grade xanthan polymer was bullheaded in an Alvheim production<br>well, causing reduced well productivity but also changed water cut trend.<br>The field pilot, follow-up laboratory studies and integrated reservoir<br>modelling point to a potential method for water shut-off and EOR for<br>Alvheim and similar fields.  |
| 14:40 | Refreshments/networking   |
| 15:10 | <b>Extended Screening Tool for EOR on NCS</b><br>Sølvi Amundrud, Norwegian Petroleum Directorate<br>In 2017 NPD performed a technical screening of the EOR potential on the<br>NCS. The technical potential is close to 700 MSm3, when 46 of NCS' largest<br>oil fields and discoveries are screened for 14 EOR methods. The screening<br>study is now extended to include operational, environmental and economic<br>criteria. The presentation shows the results of this extended screening.  |
| 15:40 | OGA's role in getting EOR projects realised on<br>the UKCS<br>Panteha Ghahri, Oil & Gas Authority UK<br>This study look at the current state of UKCS EOR projects, OGA activities<br>and collaboration with industry and universities. The OGA currently<br>supports number of EOR joint industry projects (JIPs) and carrying a lab<br>study work to screen low sal EOR for the number of UKCS fields. The<br>results of the first screening test fluid-fluid are out and show a positive<br>response.   |

| HOUR: | DESCRIPTION:  |
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| 16:10 | <b>Balder X, with 4D!</b><br>Alexandre Bertrand, Vår Energi<br>Vår Energi took over the operatorship of Balder and Ringhorne in 2017 and<br>initiated a major redevelopment plan to maximize the area potential by<br>extensive infill drilling, increasing processing capacity and extending field<br>life. In 2018, a new seismic monitor survey was acquired to support this<br>new development phase. Results from 4D processing show high<br>repeatability and have been integrated at various stages of the<br>redevelopment project: 4D history match, target de-risking through<br>monitoring of fluid movements, detailed well planning. |
| 16:40 | Computational fluid dynamics (CFD) for well<br>inflow modeling<br>Michael Byrne, Lloyd's Register   |
| 17:10 | End Day 1   |
| 18:00 | Conference Dinner at Sola Strand Hotel  |

## Wednesday 13. November

| HOUR: | DESCRIPTION:   |
|-------|--|
| 08:30 | Coffee and Registration  |
|       | Challenging Reservoirs, Reservoir Learning<br>and new technology<br>Chair: Anders Soltvedt, Norwegian Petroleum<br>Directorate & Thom van der Heijden, Equinor   |
| 09:00 | <b>Keynote: A significant resource base providing<br/>great opportunities</b><br>Ingrid Sølvberg, Norwegian Petroleum Directorate  |
| 09:30 | Valemon, the bewitched King? Who can break<br>the spell?<br>Marte Ona Høistad, Equinor<br>Valemon is an HPHT field discovered in 1985, and the PDO was approved in<br>2011. At the time of the approval, five exploration wells were drilled in the<br>area and were estimated to have proven 20% of the in-place volume. The<br>80 % of the resources not proven had a probability of discovery larger than<br>80%, with a large distribution in the in-place volumes and reserves. Today,<br>16 producers have been drilled; two of these were not completed due to<br>water, and one did not reach the reservoir. The recovery factor, based on<br>the expected PDO reserves/in-place volumes (oil equivalents) was 44%<br>with 11 production wells. With the current 13 producing wells, the<br>predicted recovery factor based on RNB2020 is 28% (oil equivalents). My<br>presentation will focus on some of the main challenges we have had to<br>understand the low recovery factor at Valemon. |
| 10:00 | <b>The value of well testing</b><br>Søren Hegndal-Andersen, Lundin<br>Well testing has been an integral part of Lundin Norway's exploration and<br>appraisal strategy for many years. This presentation will illustrate the<br>value and key role well testing has played in the appraisal of Lundin's<br>discoveries, including the Edvard Grieg and Johan Sverdrup fields.   |

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| 10:30 | Refreshments/networking   |
| 11:00 | Ivar Aasen Drainage Strategy and Status after<br>3 years of Production<br>Kjell Christoffersen, AkerBP<br>The presentation will focus on the following key issues: • Drainage strategy<br>• Importance of well design • Water injection challenges • Pressure decline<br>and GOR increase • Drilling 2 new injectors to increase reservoir pressure •<br>Drilling 2 new producers   |
| 11:30 | <b>Gullfaks Shetland the hidden carbonate gem</b><br>Elisabeth Iren Dale, Equinor<br>A fascinating story of a chalk reservoir in the overburden discovered 26<br>years after the production start of Gullfaks. The presentation will take you<br>through the development from discovery to production, and will describe<br>how Gullfaks manages to maintain production from Shetland without<br>hindering the development of the main reservoir below.   |
| 12:00 | <b>Lunch</b><br>Chair: Vincent Kretz, Dyas Norge & Alexander<br>Shadchnev, Schlumberger   |
| 13:00 | EMBRACE - minimizing prediction uncertainty<br>in reservoir modelling<br>Vedad Hadziavdic, Wintershall Dea  |
| 13:30 | Groundbreaking and efficient stimulation<br>technique for increased oil recovery on the<br>Norwegian Continental Shelf<br>Lars Tore Berg, Fishbones<br>Presentation will view and discuss the three recent (2019) MST installations<br>in the North Sea, in both carbonate and sandstone formations. Multilateral<br>Stimulation Technology (MST) has proven to increase productivity in<br>numerous wells and is experiencing increased attraction in the global E&P<br>industry recovering from the downturn.   |
| 14:00 | Refreshments/networking   |
|       | Sustainability  |
| 14:30 | CO2 storage, uncertainty in plume migration -<br>CCS Northern Lights project<br>Szczepan Polak, Equinor<br>The Northern Lights Project is a part of the full-scale CCS project. It is a<br>result of the Norwegian government's ambition to develop a full-scale CCS<br>value chain in Norway by 2024. The studies in the project cover capture of<br>CO2 at the waste-to-energy plant and at the cement factory, and the<br>combined transport and storage solution, governed by the collaboration<br>agreement between Equinor, Shell, and Total in the Northern Lights<br>Project. One of the main challenges within underground storage of CO2 is<br>evaluation of its migration in the subsurface after it has been injected. The<br>storage formation in the exploitation license where the project plans to<br>store CO2 has not been previously appraised. This gives high level of<br>uncertainty in the modelling of plume migration. |
| 15:00 | Sustainable resource development - Hywind<br>Tampen<br>Jan Addics, Equinor  |
| 15:30 | Re-cap by chair of the program committee  |

| HOUR: | DESCRIPTION:            |
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| 15:40 | END of conference day 2 |