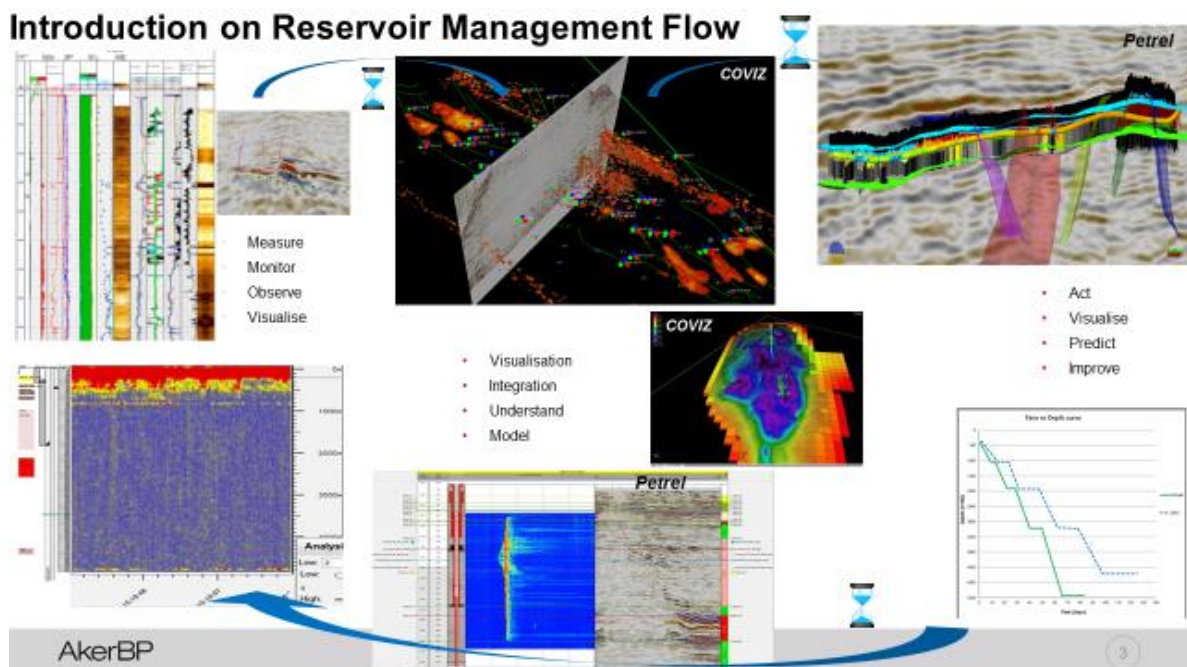


Effective reservoir management of the Valhall field: subsurface integration using state of the art visualization tools. Nirina Haller (AKERBP)

The Valhall field is a mature field with more than 300 subsurface penetrations and is in production since 1982. Valhall has been a pioneer field for several technologies in the early 2000, like 4D seismic monitoring and more recently intensive use of Fiber Optic technology for wells surveillance. The use of technologies was necessary in particular to monitor the time variant overburden subsidence, due to chalk compaction under depletion, and consequently ensure a continuous safe production with safe infrastructures and wells. The Valhall team has therefore a large experience in handling data and subsurface complexity and there has been continuous efforts to improve our integration workflows. In particular, it was recognised early that the time component of the monitoring process needed to be properly managed in our softwares and models. This presentation shows how the Valhall team combines the various platforms for integration and visualisation (Petrel, Coviz, Palantir) for delivering the first well of the 2017 drilling campaign.



The figure above illustrates the central role of visualisation and integration in the reservoir management flow. Starting with our objectives on the right, for example geosteering a well in a structurally complex reservoir section, it is mandatory to visualize first the interpreted data. The data acquisition strategy presented on the left is therefore critical to bring answers on reservoir quality at high resolution (logs) or structural setting (seismic). Fiber Optic (Distributed Acoustic Sensing, DAS shown on that figure), have been recently introduced at Valhall, primarily to assess well integrity and now also as a tool to support reservoir management. A chapter of this talk is dedicated to illustrate the value of DTS (Distributed Temperature Sensing) for establishing diagnostic at a water injector. Facing data complexity and diversity, and now big data challenge with the DAS, we believe that the keys to an efficient reservoir management flow is not a unique platform, but in developing the links between powerful and dedicated applications (Coviz and Palantir in our case) with the chosen integrated platform (Petrel). Petrel indeed lacks a dynamic management of the data (except for the reservoir model); Coviz and Palantir fill this gap as they are dedicated to reflect the chronological relationship between data. Having the right set of softwares to handle data in space and in time allows the reservoir management team to deliver its objectives as planned and without stress...and in the example of that presentation, to deliver more than the plan!