GMN Technical Meeting – Call for Abstracts

Topic: Digitalisation and PPFG
Standards and Assurance in PPFG

Date: Tuesday 22nd September 2020 – Wednesday 23rd September 2020

Time (EUR): 09:35 to 15:45 Tuesday 22nd Sept
09:45 to 15:45 Wednesday 23rd Sept

Time (UK): 08:35 to 14:45 Tuesday 22nd Sept
08:45 to 14:45 Wednesday 23rd Sept

Host: OMV – Jennie Aumayr: JenniferMary.Aumayr@omv.com

Meeting Location: Virtual

Contact: Richard Shelton/ Dawn Dukes, OTM Consulting Ltd, Great Burgh, Yew Tree Bottom Road, Epsom, KT18 5XT, UK +44 (0)1372 631950
Richard.Shelton@otmconsulting.com / dawn.dukes@otmconsulting.com

Attendees: [as at 08 09 2020]

	Company	First Name	Last Name
1	CNOOC Petroleum Europe Lim	Stephan	Petmecky
2	Eni S.p.A	Alfio	Malossi
3	Eni S.p.A	Pamela	Tempone
4	Eni S.p.A	Federica	Ferrari
5	Eni S.p.A	Gianfranco	Bagnoli
6	Eni S.p.A	Riccardo	Mandrioli
7	OMV Exploration & Production	Mira	Persaud
8	OMV Exploration & Production	Oliver	Knoop
9	OMV Exploration & Production	Jennie	Aumayr
10	OTM Consulting	Richard	Shelton
11	OTM Consulting	Dawn	Dukes
12	Repsol	Toby	Harrold
13	Repsol	Pascal	Rouillé
14	Repsol	Sara	Martinez
15	Shell	Dean	Thorpe
16	Shell	Tom	Sinclair
17	TOTAL E&P	Olivier	Chailan
18	Tullow Oil	Benjamin	Quaillet
19	Wintershall Dea	Georg	Röser
20	Woodside Energy Limited	David	Tassone

Tuesday 22nd September

Day one - Digitalisation and PPFG			EUR	UK
Arrival with tea/ coffee			09:35	08:35
1	Welcome and objectives for the meeting	Richard Shelton, OTM	09:45	08:45
2	Introductions	All	10:00	09:00
3	Digitalisation in OMV Upstream - DigitUP	Guest Speaker, Dr. Roman Spitzer, Senior Advisor Digital Subsurface, OMV	10.15	09:15
4	Digitalisation, Standards and Assurances in Subsurface Pressure Predictions: A Woodside Perspective	David Tassone, Woodside	11.30	10:30
Lunch			12:15	11:15
5	Digitalisation – what's in it for PPFG?	Georg Roeser, Wintershall Dea	13:00	12:00
6	Learnings of a year-long project on Digital Pore Pressure	Pamela Tempone, ENI	13:45	12:45
Break			14:30	13:30
7	Digitalisation in PPFG	Oliver Knoop, OMV	14:45	13:45
End of day 1			15.45	14:45

Wednesday 23rd September

Day two - Standards and Assurances in PPFG			EUR	UK
Arrival with tea/ coffee			09:45	08:45
8	Welcome	OTM, Richard Shelton	10:00	09:00
9	PPFG prediction assurance - an integral part of the well delivery process to ensure safe and efficient well construction	Stephan Petmecky, CNOOC	10:05	09:05
10	Well Delivery Process, the 3W conceptual phase: taking the time to save time in the well planning	Olivier Chailan, Total	10:50	09:50
Lunch			11:35	10:35
11	Standards and Assurance in Tullow's PPFG prediction process	Benjamin Quaillet, Tullow Oil	12:20	11:20
12	PPFG assurance in Shell: A standard and a process you actually do want.	Tom Sinclair, Shell	13:05	12:05
Break			14:05	13:05
13	Standards & Assurance in PPFG	Jennie Aumayr, OMV	14:20	13:20
14	Pore Pressure Standards	Toby Harrold, Repsol	14:45	13:45
15	Meeting wrap up	OTM, Richard Shelton	15:30	14:30
End of day 2			15:45	14:45

Topic

Two topics are planned for the next Geopressure Management Meeting. Members may choose to talk on either or both topics depending on their experience. The breadth of these topics is to give all companies the opportunity to contribute.

The main discussion topic for the meeting is:

1. Introduction – Digitalisation and PPFG

Many companies are now transitioning into full digitalisation to manage their operation activities. This shift is being powered by a new wave of technology that allows companies to manage huge amounts of data, including real-time data, quickly and consistently to allow automation, quicker decision-making with the objective of being more strategic and efficient. This trend is set to continue as more companies understand the benefits of digitalisation and move to capitalise on them.
The process of automation is faster, more efficient and safer than offline equivalents.
Key benefits might be considered to be:

- Ability for near-real-time decisions/reaction
- Increases efficiency
- Reduces operational costs
- Enables data to be analysed
- Safer data storage in the cloud
- Lack of human error

This session is aimed at sharing best practices and benefits and discuss the impact on the interpretation and decision making. There are a number of elements that people can discuss that would be helpful for all attendees:

1) Expectations of digitalisation:
    a. Within the company: from pore pressure specialists, from G&G teams and drilling teams executing the wells as well as the wider exploration community
    b. From external contractors
    c. From partner oil companies in the operations
2) How do we decide which approach is most appropriate?
3) Should we, as an Operator forum, demand more industry-wide consistency in data delivery from all the PPFG Service Providers?
4) What type of setup do different operators use and what has been most effective?
5) Key case studies where digitalisation has been successful and helped execution in terms of safety and money saved.

2. Introduction - Standards and Assurance in PPFG

There are various standards and guidelines in Oil and Gas industry that cover upstream, including processes and activities, requirements and guidelines for systematic management, effective planning, execution and use of production assurance and reliability technology. This is to achieve cost-effective and consistent solutions over the life cycle of an asset. Presentations could address some of the following elements:

1. Industry-wide standards for PPFG predictions (in well planning), and interpretations (in the operational phase), given the safety element of PPFG-related data (eg: what safety factors are required for a drilling MW based on a range of PPFG predictions). For example, for our non-operated wells do we understand the Operator's level of risk acceptance for PPFG?

2. PPFG assurance management through the life cycle of a well or field, while also considering constraints arising from health, safety, environment, and quality;

3. Planning and implementation of new PPFG technology, technology development for design and operational improvement.

The aim of this session is to encourage people to share specifics of their internal standards and practices in PPFG related to well planning, operations and abandonment, discuss the common practices that are being applied, the most applicable approach etc.

1. Presentations

Each company is asked to prepare slides for approximately 30-45 minutes of presentation and 15 minutes for Q&A.

As witnessed at previous meetings, the demographic of the group continues to evolve and with this we politely request that presentations are sourced from each company's global resource pool and not only from the North Sea (unless of course your company only holds North Sea acreage). The meeting is a technical forum and these presentations are intended to provide a background to stimulate the discussion period. Please ensure you include case studies; and come armed with company and other industry experiences, to bring the lessons learnt and best practices to life more effectively.

2. Organisation

Please advise OTM who will be attending if you have not done so already.

3. Abstracts

From page 5.

4. David Tassone, Woodside

[Title and abstract to follow]

5. Georg Roeser, Wintershall DEA

Digitalisation – what's in it for PPFG?

Wintershall Dea (WD) has formed a dedicated department for Digitalisation. They are tasked with developing and scaling up digital solutions that have the highest impact in WD's core E&P business. The desire is to achieve ambitious goals in sustainability, safety, operational and financial performance. Once a prove of concept is performed, its impact is measured and then scaled across the company. A successful proof of concept followed by a so called minimum viable product can then be the "template" for embedding use cases into different business units. Anyone in the company can submit ideas for projects, given a solid business case.

It has been apparent that with respect to PPFG, the journey would most likely go towards handling, storing and interpreting of large amounts of data. Wired pipe alone is going to immensely increase the amount of data available in RT. Scanning and interpreting all of it and assessing their meaning and impact on operations is too much for any human to handle in RT, and only possible for an AI. Pre-drill models which are compared to the actual drilling data, as the well is being drilled, already exists but with the increase in data volume and type this can become a very powerful tool for increasing safety and fostering efficiency.

While the previously mentioned topic is still theoretical for the time being, another project discussed by WD's PPFG team, a company wide data base featuring all relevant pressure data available, has already been started. As this idea was also discussed by other subsurface disciplines, forces were joined, and the scope was increased from just pressure data to all relevant subsurface data. The idea is to also include historical data as much as possible, and to come up with a solid system for quality checking and flagging. The first phase, being the assessment of what data should be covered, has been completed by now. The next step would include finding a suitable way to ingest and store PPFG data in the cloud which follows the industry standard for PPFG data model being developed by the OSDU (Open Subsurface Data Universe). Lastly, this data would then be made accessible through open APIs so that it can be consumed by the latest AI/ML driven applications.

6. Gianfranco Bagnoli, Eni

Learnings of a year-long project on Digital Pore Pressure

Effectively managing Geological Operational Risks and decreasing Non-Productive Times were the main objectives of our year-long project on digital pore pressure for those mature contexts with larger experience on geopressure evaluation. In this presentation, we share some of the learnings acquired during the delivery of the project.

Expectations for Artificial Intelligence are sky high, but AI algorithms are not natively "intelligent." You need to have a deep appreciation about what is required to produce an efficient and effective AI tool. AI learns inductively by analysing data, so everything starts investing in AI talents and building robust information infrastructures. Then you need to have strong support from senior leadership and SMEs (Single Matter Expert), together with an integrated and collaborative team. We will give some example of our experience.

We will touch on how we aggregated different source of data to prepare our baseline training-data set. A properly designed ETL (Extract, Transform, Load) system extracts data from the source systems, enforces data quality and consistency standards, conforms data so that separate sources can be used together. Finally, we deliver data in a presentation-ready format so that data scientists can build AI models and end users can take decisions.

One of the main focusses of our projects was the interpretability of our models and results, that is a requirement to choose which approach is most appropriate to use. In examples, we need to identify biases and overfitting that sometimes are hidden in our data and may impact our models. This process produces rules of how to control and supervise our machine in a safe, efficient and effective way. Deciding which approach is most appropriate takes time and good teamwork. We will share some example of how we approached the problem.

With this presentation, we share some example of digital tools applied to pore pressure prediction. In example, how improving our information structure, ETL process, governance of data ingestion and model development/deployment may uniform analyst approach and reduce human error, impact near-real-time decision making, pore pressure monitoring efficiency and geological operational costs.

7. Oliver Knoop, OMV

Digitalisation in PPFG

OMV is undergoing a “digitalisation overhaul” in many functional areas in Upstream, but what about the “PPFG world”? PPFG relies on a range of data from various sources & vintages, commonly it is multi-disciplinary and may use data which is assigned to different data-domain functions. For example, it includes PPFG work being performed on real-time, time-based drilling and mudlogging data for operational decision-making; as well as PPFG work being performed on historic or scanned/reported well data for potential future well planning. For the move to more digitalisation in PPFG & to achieve the wished-for efficiencies, all of these different types of data, regardless of their origins, should be archived in a consistent, quality-checked way. An example of OMVs experience of using data-streaming for pore pressure interpretation for a recent well will be discussed.

9. Stephan Petmecky, CNOOC

PPFG prediction assurance - an integral part of the well delivery process to ensure safe and efficient well construction

CNOOC International has a clearly defined well delivery process which is used globally to delivery wells in a consistent and safe manner. Peer-reviewed Standards and Procedural Aids exist for all activities within the well delivery process (WDP), clearly outlining deliverables for each phase as well as listing all mandatory reviews for key technical items. Approved standards and guides for the WDP are controlled and centrally stored in the CNOOC International Management System (CIMS).

A rigorous PPFG prediction assurance step was introduced and implemented within the Exploration organization in 2015 and later adopted for Development wells. It includes a globally standardized assurance document. This mandatory PPFG review typically takes place towards the end of the Select phase of the CNOOC Intl. WDP. Without it, the well Statement of Requirements (SOR) cannot be approved, which also stops the process from progressing through a Stage Gate into the next phase, called Define. This approach puts two checks in place - the signature of the PPFG Subject Matter Expert on the SOR and proof of an assured PPFG prediction at the Stage Gate review meeting - to ensure no well passes from Select into the Define stage of the well delivery process without a reviewed PPFG prediction.

The above-mentioned standardized assurance document contains a set of technical questions which must be answered. The digital data of the reviewed curves as well as PPFG graphs in pressure and equivalent mudweight (EMW) are embedded in the document.

The presentation will demonstrate where the PPFG assurance steps sit within the CNOOC Intl. WDP, why this activity is not outsourced, and which technical questions are being asked during the final review.

10. Olivier Chailan, Total

Well Delivery Process, the 3W conceptual phase: taking the time to save time in the well planning

Past experiences have shown the preparation of Exploration wells are not always streamlined. Often changes in targets, surface locations, trajectories and other strategic decisions result in delays to the well preparation process as numerous updates, re-processing, addendum are required. This can consequently cause difficult communications and misunderstanding between parties (Exploration Team, operational teams, partners and government officials).

In the past this problem was put aside due to the tight timeline to prepare exploration wells versus the commitment in the block contracts or the internal strategic decisions. However, when stepping back to view the whole process, one can clearly see that advanced planning, which anticipates and incorporates and the possibility of change, can be far more efficient while producing the desired output.

Recently in Total a new Well Delivery Process has been put in place involving the whole exploration chain, and it starts with the so-called '3W Process'. Very early in the prospect maturation stage, operational teams are involved (pore pressure specialists, geomechanics, drilling team) in order to prepare several options to drill a same prospect. The 3W stand for Why, Where, When and is designed to address all the uncertainties around the prospect objectives and targets in order to be able to choose and switch rapidly from one option to the other when new data, study, or any non-technical constraints makes the well preparation to evolve.

This presentation aims at detailing how Total is trying to fasten the well delivery process by preparing several alternatives to the well preparation of a prospect to drill and how PPFG is a key milestone in this whole process.

11. Benjamin Quaillet, Tullow Oil

Standards and Assurance in Tullow's PPFG prediction process

In the aftermath of the Macondo disaster various pieces of legislation were written up throughout the world to tighten up and regulate oil exploration companies' approach to loss of containment risk. From now on, they must be prepared and equipped for this risk.

The formation of the GPLT and the creation of the GP-MS was a demonstration of Tullow's initial commitment to putting in place preventative measures and controls, using dedicated assurance reviews, state-of-the-art technology and best practices, to ensure that Geopressure related risks are mitigated. Today the processes have evolved, a Geopressure Standard has been put in place which is now more integrated with other functional standards in the company and new tools have been developed to facilitate PPFG characterisation. Different levels of assurance (internal and external) have been introduced to make sure the right processes are in place and followed at a corporate level and that PPFG predictions are sound; thus ensuring continuous improvement.

Recently the fading memory of the Macondo incident and the multiple material downturns the Oil industry has seen is unfavourably affecting the overall visibility, importance and thoroughness of PPFG predictions. Companies will need to cleverly adapt its processes to the new reality if we don't want history to repeat itself.

12. Tom Sinclair, Shell

PPFG assurance in Shell: A standard and a process you actually do want.

In 2006 Shell set up a group wide assurance process as a consequence of the high profile industry incidents and the reserves crisis in 2004. Any business or safety critical decision or deliverable falls under the standard and this includes PPFG analysis as its deemed a process safety workflow. This talk will give a high level overview on how the group assurance process is set up and how the standard is applied with respect to PPFG assurance. By having the standard it puts in place numerous check points or barriers to hopefully stop a PPFG related incident from occurring. However, as with any safety related process when the barriers are not all aligned up then mistakes can occur which may lead to a high potential incident. This is simply the human factor and the this talk will also explore this element and how it is important that a learner's mindset is adopted.

13. Jennie Aumayr, OMV

Standards & Assurance in PPFG

OMV now has internal regulations which cover PPFG, with the owner for "simple" wells with 1d-models being the Head Office Operations Geology Group; "complex" wells, including 3d-models, are managed by the Geomechanics Group. The PPFG regulation applies to operated wells, but can also be used to support teams working on non-operated assets. The Head Office Operations Geology Group also perform a governance and assurance role as part of the Well Delivery Procedure Assurance process, this includes optimization workshops, reviews and two approval gates, as part of these the PPFG work will also be checked; however for special wells (complex wells, or those with a high uncertainty or high impact) an additional PPFG-focus peer-review is required.

14. Repsol – Toby Harrold

Pore Pressure Standards

[Abstract to follow]