**Operator Wellbore Survey Group (OWSG) Meeting, Fort Worth, 3/2/16 – Minutes**

Attendees

Neil Bergstrom (Colorado Geoscience)

Son Pham (ConocoPhillips)

Jonathon Lightfoot (Occidental)

Lisa Grant (NobelEnergy)

Roger Goobie (BP)

Heather Vannoy (EOG)

Jim Oberkircher (New Horizons)

Brian Gilmore (Pioneer Natural Resources)

Pete Clark (Chevron)

Avinash Ramjit (ConocoPhillips)

Shawn DeVerse (Surcon)

Stefan Maus (MagVar)

This meeting was held in association with ISCWSA meeting #43.

Next meeting – TBD and expected to be Q2 ‘16

Agenda

* Anti-Trust and Mission statements
* OWSG leadership
* Electronic magnetic QC associated with OWSG PU models
* API RP78
* Relationship between OWSG PU model sets and ISCWSA Error Model Maintenance recommendations

Minutes & discussion summary

Both anti-trust and mission statements were read

Leadership

Due to Neil Bergstrom’s change of circumstance and length of service a new leader for the OWSG was sought; Pete Clark (Chevron) volunteered and was accepted by the group

Son Pham requested that the post of secretary also be reassigned; Jordan Meyer (Nobel Energy) was proposed, was acceptable to the group and subsequently agreed

Electronic Magnetic QC

Stefan Maus & Shawn DeVerse were kind enough to present some suggestions on how to QC electronic magnetic data to help ensure it fulfils the associated OWSG PU models based on declination source and applied corrections.

QC based on error model term values

The three QC factors (total magnetic field, dip and total gravity field) are often treated as independent having a target value with associated tolerance however there is some correlation between these three calculated variables as dip involves all six mag and accel sensors to in fact the appropriate combined QC shape is not a simple cuboid with dimensions dictated by ±tolerance but instead should be rendered as an ellipsoid with tangential bounds based on ±tolerance. Using the ellipsoidal QC model three concentric cuboidal regions can be identified; the smallest cuboid is aligned to the three QC axes (TMF, Dip & TGF) and is entirely contained within the correlated QC ellipsoid. The middle cuboidal region is given by the standard QC approach and contains the ellipsoid with boundary planes tangential to the ellipsoid’s surface while the third region is everything outside. For QC purposes, if the data fulfils the inner cuboid is passes QC, if it falls between inner and outer cuboid region it passes but with caution while being outside the outer cuboid it fails QC. In this way QC tolerances can be assigned to each of the three variables identifying clearly passing and failing along with the region where only a limited percentage of directional survey measurements should lie. The QC is also dynamic as it is based directly on the PU model term value inputs. Being dynamic means that the QC boundaries are dependent on the wellbore’s attitude (inclination and azimuth)

A web based application was demonstrated that would enable these QC limits to be evaluated in real time. This web-app would also recalc from raw sensor data and independently apply declination and convergence

Where data is failing QC a suggested approach is to increase the confidence level associated with the PU model however since confidence level (sigma) is generally set at a universal level rather than an individual survey log there may be some issues arising

**Action** – discuss this approach to QC at the next OWSG meeting with a view to presenting it at a subsequent SPE WP TS meeting

API RP78

Discuss progress towards this recommended practice. As the slides will be incorporated into the SPE WP TS minutes neither the presentation or the associated discussion will be reproduced here.

**Action** – Work on RP78 is ongoing. As per presentation API will elicit greater industry participation at an upcoming meeting

OWSG PU models and Error Model Maintenance Sub-Committee remit

Concerns had been expressed that the OWSG models were created without appropriate reference to the EMM sub-committee. As the OWSG are also a SPE WP TS sub-committee it is important that any conflicts between these two groups are avoided and both groups have written up “rules of engagement”. These were reviewed, agreed and presented at the EMM sub-committee. Subsequent modifications were made based on suggestions.

**Actions** – The modified rules of engagement are attached here as an appendix for review and will be posted to the OWSG section of the ISCWSA.net website along with these minutes

Additional Item – With API RP78 ongoing it was agreed to limit OWSG meeting to one per quarter.

**Appendix 1**

OWSG and SPE WP TS Error model maintenance sub-committee rules of engagement

Operator Wellbore Survey Group (OWSG)

OWSG Mission

* To promote practices that provide confidence that reported wellbore positions are within their stated uncertainty

OWSG created several sets of tool positional uncertainty models

* Described in SPE 178843
* Comprehensive, Reference set
* Compatible with ISCWSA / SPE WP TS PU model framework
* Intent – allow user to take a consistent & systematic approach to PU model rather than piece meal PU models based on application & correction
* Not linked with any specific DD contractor, directional survey measurement provider or directional software; vendor neutral
* No warranty expressed or implied
* Made available for adoption, however adoption is voluntary and is a decision for each individual or entity
* Associated QC can be back-calculated from terms values however no term validation beyond SPE 178843 is offered

Additional of models

* New tool parameter models can be created by any entity, for any purpose, at anytime etc.
* OWSG = A/B/E, C = Contractor, D = Template gyro, O = Obsolete
* C – provided by contractor for ease of distribution. Checked for consistency with model framework (all expected terms present with appropriate weighting and correlations coefficients). No comment on term values
* For a new model to be adopted as OWSG
  + Requires initial approval at OWSG meeting to promote to “E” list
  + Consult with ISCWSA error model maintenance sub-committee to help ensure consistency
  + Subsequent agree adoption at OWSG meeting. Either remove from E to move from E to A/B
  + Neither E nor C set models will be offered for voluntary adoption through any ISCWSA / SPE WP TS website

Additional work – general models for

* Dual Inclination (DI)
* Extended Course Length (XCL)
* Interpolated Azimuth
* Model selection guidance / flowchart

OWSG’s understanding of Error model maintenance sub-committee remit

* Model terms, weighting function, correlation coefficients
* Standard MWD model and its derivatives
* Implementation and description for
  + Modelling specific situations such as Blind, Inc Only, Extended Course length
  + Appropriate PU modelling of application and corrections
  + Appropriate PU model of declination uncertainty based on source