

Error Model Maintenance Group

Industry Steering Committee on Wellbore Survey Accuracy Wellbore Positioning Technical Section

47th General Meeting
April 11th, 2018
Inverness, Scotland



Speaker Information

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- Andy McGregor
- Chairman Error Model Maintenance Group

Speaker Bio



- Technical Director,
- Angus Jamieson Consulting Ltd.
- 25 years in navigation and positioning
- 12 years in wellbore survey
- Inverness, Scotland
- Specialised in sensor fusion, survey algorithms, error modeling

Angus Jamieson Consulting Ltd



- Providing wellbore positioning software and algorithms
 - MSA, Torque and Drag, Error Modelling, Anti-Collision
- Test well facility

Documentation

- Error model definition document on the website
 - Combines information from MWD & Gyro papers
- Release notes for latest release
- Spreadsheet definition of current ISCWSA models
 - Same format as OWSG
- ISCWSA models aligned with OWSG
 - OWSG Diagnostics from Copsegrove applicable
- Example implementation spreadsheets
- Currently all at Rev4

XCL Models

- Last meeting we defined Rev5 of the error model, including long course length terms
- As other implemented these, it's become apparent that some details were not completely clear and well defined.
- For example: final value for default tortuosity, whether the XCL could be one source or whether it needed to be two, handling of vertical wells, sidetracks, inc only models
- Still important that these are released.
- Small group of implementers to finalise and document these details with a view to releasing ASAP.

- Total looking to further develop the WITSML format for transfer of error models
- Currently a small working group – Total, Energistics, DGI, SLB, AJC
- Expecting to have a draft release this year
- Completion of the work by end of 2019
- Looking to match parallel work being done on P7
- WITSML will support real-time data transfer, P7 more focused on EOW and final archive of surveys.
- Open to other participants. Basecamp site for access to on-going material
- Contact scott.farmer@total.com

Revision of Misalignments

- Belief that current misalignments may be overly conservative
- Jerry Codling has presented some work on this and proposed that the
- XYM3/4 term magnitudes increase to 0.3 deg and become random for while drilling surveys
- Seems to fit available data better.
- Some concern that by introducing random term, if very short survey interval is assumed we'll end up with very, very small ellipses in top hole.
- Need more data to validate or continue to keep a small systematic term
- Formal request from group to operators to release data to support this

- Question about behavior of DREF term in random and systematic cases.
- Justification for current numbers does not seem to be documented
- DREF-R used in fixed platform cases – pipe stick-up?
- DREF-S for changes rig height due to platform ballast changes?
- From numerical examples, DREF-S behavior appeared anomalous at first sight
- Not clear that it is producing the required output
- Effect is small

Transition from Directional To Inc Only

- Query about guidance on handling well position when transitioning from a directional survey to inc only survey
- Should a min-curvature arc be assumed to a sharp corner to vertical
- RevD of our guidance document defines later in tables
- Need to highlight this in text
- Get guidance document out of draft and on to website.

Handling of Tie-Ons

- In the case where a directional survey is followed by blind drilling with a long survey gap between last proper survey and assumed blind drilling TD point.
- Different software handle this situation differently
- One assume whole interval is blind, another assumes directional to the halfway point
- Maybe that correct handling in well surveyed case, does not give correct handling in more unusual situations
- To be investigated further