Error Model Maintenance Committee Update

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Speaker Bio

- Andy McGregor
- Technical Director, H&P UK.
- Inverness, Scotland
- 25 years in navigation and positioning
- 18 years in wellbore survey
- Previously with Tech21, Weatherford, AJC
- Specialised in survey management, algorithms, error modeling,

Error Model Sub-committee Meetings

- Spring sub-committee meeting will be in two weeks:
  - 13th April

- Since last main ISCWSA
  - Sub-committee meeting (21st October 2021)
  - Several meetings of side-track uncertainty working group
  - Meeting of working group on breaking down models into component blocks

Revision 5

- Major software teams are starting to implement.
- Many operators keen to adopt rev 5 once software available.

- Presentation created to help explain rational for rev5 to management
- Minor corrections to XLA term (addition of a sin(dAz) term)
- Conditions on XYM3/4E course length correction.

Other Items

- Effect of revision 5 on relative instrument performance tests.
- Addition of QA\QC terms to models
  - Avoid need to read across from other models in that release
  - Including gravity noise and uncertainty.
- Best practise document on handling site and slot uncertainty.
- Best practise document selecting appropriate model for un-surveyed wells
  - Process to apply something other than Blind Drilling
  - Handled by collision avoidance document.

Working Group - Dynamic Generation of Models

- MWD models naturally breakdown into component groups:
  - Instrument terms, geo-mag reference, depth, misalignments, corrections
- Set of models is valid permutations of these
- Should we define our models this way
  - Allow user software to generate all appropriate combinations on fly
  - Reduce effort for update of models
  - Transmission of models between software.
- Several software packages already do this
- Lengthy discussion about pros and cons from ISCWSA perspective.

Working Group - Handling of Errors in Side-tracks

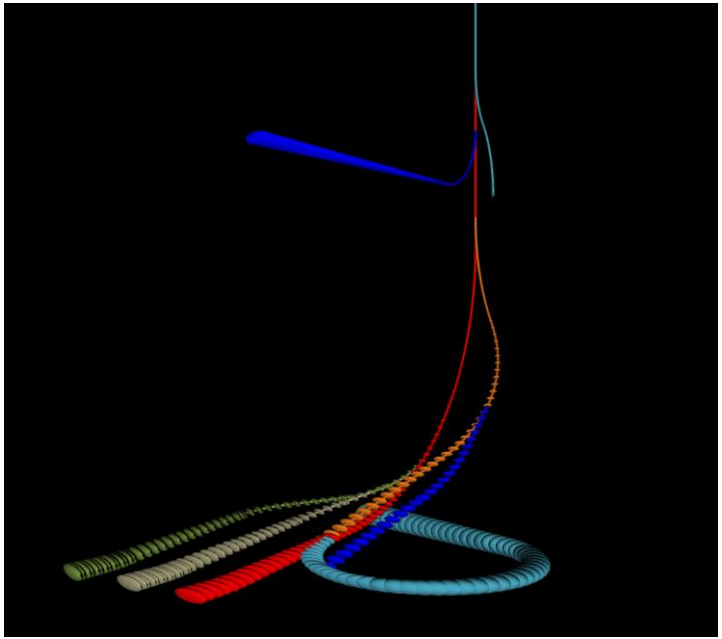
- Collision avoidance test set includes a side-track well.
- Inconsistency in handling errors for that well between software packages
- Setup a working group to recommend best practice.
- 11 meetings

Calculation of Side-track Relative Uncertainty

- Existing method of calculating relative uncertainty will apply.
- Repeatedly we found that there isn't much special about side-tracks.
  - Most factors apply equally well to independent offsets.
  - Simple RSSing of pedal curve radii does not manage global terms correctly
- Much detailed discussion over the specifics.
  - Ended up deep in how the error model works
  - Need for further worked examples of how Williamson's relative correlation works
  - Should have zero relative lateral uncertainty at the side-track point
  - Discussion about whether this requires specific handling
  - Will create explicit examples/test cases for website

Progress

- Best practice document drafted
  - To be presented at forth-coming sub-committee meeting for approval
- Test cases & diagnostics
- Relative Correlation (independent wells)
  - Detailed Excel worked example
  - Re-run collision avoidance test set
    - Rev 5, MWD+HRGM+Ax + apply relative corr.
- Additional side-track cases (6 new wellbores)
  - Side-track of a side-track
  - Multi-laterals
  - Side-track comes back on parent
  - Gyro surveys



Questions

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