



# Error Model Sub-Committee Update

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# EMM Virtual Meetings

- Two virtual meetings on Zoom
  - ~20 attendees at each
- Worked well
- Thanks to those that took part.



## Revision 5 – Status

- In Calgary, agreed to release as beta
- Changes are:
  - Addition of course length dependant terms (XCL)
  - Changes to misalignments and sag
    - XYM3E, XYM4E, SAGE
    - With minimum course length damping term
  - Breakout of geo-mag terms for relative correlation
  - Defined handling of tie-on to surface
- All companies @ virtual EMM intending to implement or adopt



# Rev5 Documentation on Website

- Release note identifying changes
- Error model definition document @ rev5
- Tech Note on XCL Models + Misalignments
- Tech Note on Correlated Geo-mag Terms
- Spreadsheet defining core ISCWSA MWD models
- Diagnostics on test wells (30m/100ft intervals)
- Example calculation spreadsheets for test wells

# Review and Omissions

- Live documents
- Diagnostics need to add irregular survey intervals
- Diagnostics add cases for relative geomagnetic correlation
  - Led into a discussion about link between error model and collision avoidance test sets.
  - Generally distinct – since they are designed to test different things
    - e.g. wells above 90 deg, wells going back on themselves as opposed to relative well geometry
- Further comments and corrections welcomed.



# Documentation on Website

- One page on website to find all the relevant and most recent docs
- Rev5 Error Model details
- Previous release of OWSG models
  - Definitions, diagnostics and flow chart for selection

<https://www.iscwsa.net/error-model-documentation/>

# OWSG Models

- EMM took over responsibilities for these at last meeting
- Previous OWSG release (rev2) on ISCWSA website
- 101 models in the set
  
- Change name to “ISCWSA Generic Set of Tool-codes”
  - “Default set of conservative tool-codes for use when tool specific models are not available”
  
- Quote obtained for upgrade to rev5
  - Work urgently required



# Changes to Generic Models

- MWD variants – all of rev5
- EMS – all of rev5
  - Disturbance field terms unchanged.
- Older tools
  - add XCL terms
  - Not misalignments or geomag
- FINDS, BLIND, BLIND+Trend, Zero
  - – no change
- Misalignment changes implicitly for BHA on drillpipe

	XCL	XYM3E + XYM4E + SAGE	GeoMag
MWD	✓	✓	✓
MWD+AX	✓	✓	✓
EMS	✓	✓	✓
EMS+AX	✓	✓	✓
GYRO-MWD	✓	✓	
GYRO-NS	✓	✓	
DIPMETER	✓		
CB_FILM	✓		
BLIND (+TREND)			
INC ONLY	✓		
UNKNOWN	✓		
FINDS			



# Re-name of MWD Tool-code

- MWD tool-code has terms for a standard definition geo-mag model
  - Historically BGGM
- BGGM has increased resolution, now a high-def model.
- Mag references in use today:
  - high-def models: MVHD, HDGM, BGGM - these use **MWD+HRGM** & variants
  - 5 year update models: IGRF + WMM – these use **MWD+IGRF**
  - Standard definition rarely used. Now mainly historic.
- Hence “MWD” will be named **MWD+SRGM**
  - along with explanatory notes.

# Ideas for Future Work

- **Different axial interference models:**
  - Short / medium / long spacing (100 / 200 / 300nT)
  - High interference model (~1000nT)
- **Add terms to Support QC**
- **Effect of twist (accel / mag axial misalignment)**
- **Continuous surveys**
- **Framework for including synthetic or mag interference surveys**
  - i.e. occasional lower accuracy points without tie-on
- **Multi-station models**
- **Update depth model**
- **Or don't keep meddling??**

# Decision Process

- View to help set the agenda for next EMM meeting
- Any other suggestions to me by 14<sup>th</sup> May
  - [andy.mcgregor@hptech.com](mailto:andy.mcgregor@hptech.com)
  - Accept suggestions from anyone
- Setup an Survey Monkey online poll
  - EMM committee only



# Questions

