



# Collision Avoidance Subcommittee Update

CA Meeting #37 24-Sept-2025  
1:00 pm –4:30 pm ~3hrs

Darren Aklestad - SLB  
24 Sept 2025



## Wellbore Positioning Technical Section



The Industry Steering Committee on  
Wellbore Survey Accuracy (ISCWSA)

- Darren Aklestad
- 34 yrs Schlumberger/SLB
- Wellbore positioning, well planning, anti-collision, cartographic systems, survey corrections
- Aklestad@slb.com



# Attendees summary

- 30 Attendees (12 Online) (42 total)
  - 26 companies
    - 8 Operators
    - 10 Service Providers
    - 3 Software vendors
    - 2 Survey QC
    - 3 Consultants



# Agenda

1. Review Probability of Collision activity & status
2. Mike Attrell – Inclination Only Toolcodes
3. CA Going Forward



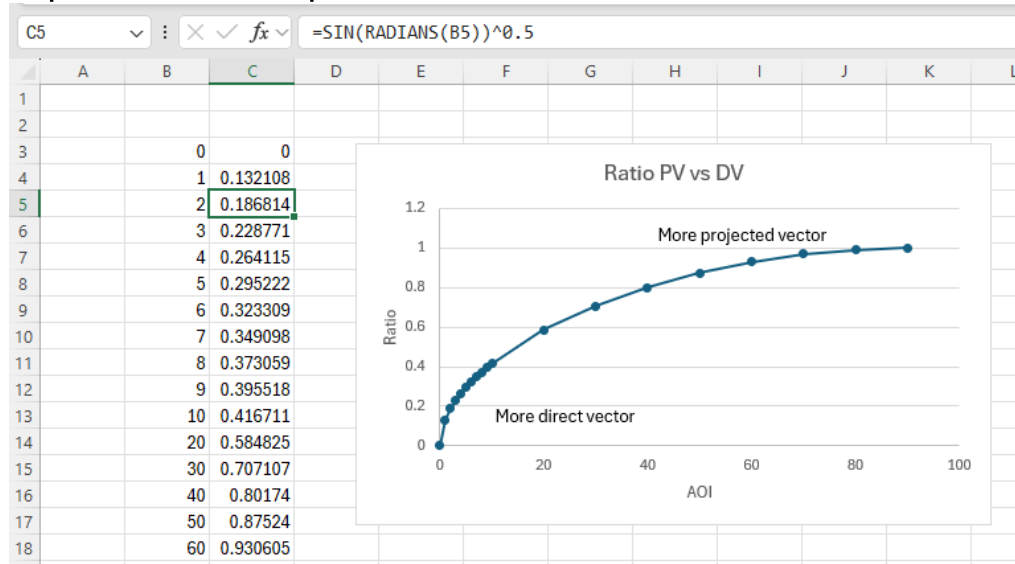
# Probability Of Collision - Workgroup



1. Koen Noy – Shell / KOC
  - Group Organizer project manager
2. Jerry Codling – Halliburton
  - Landmark Compass
3. Stephen Winchester – Baker Hughes
  - Dynamic Graphics Well Architect – Craig Sim
4. Darren Aklestad – SLB
  - DrillPlan / Drilling Office DOX - SLB Beijing – Peng Jin

# Probability of Collision – Algorithm Freeze

- Update from previous details on vector selection and transition



Smoothing change from the previous presentation for the transition between DV (direct vector) and PV (projected vector)

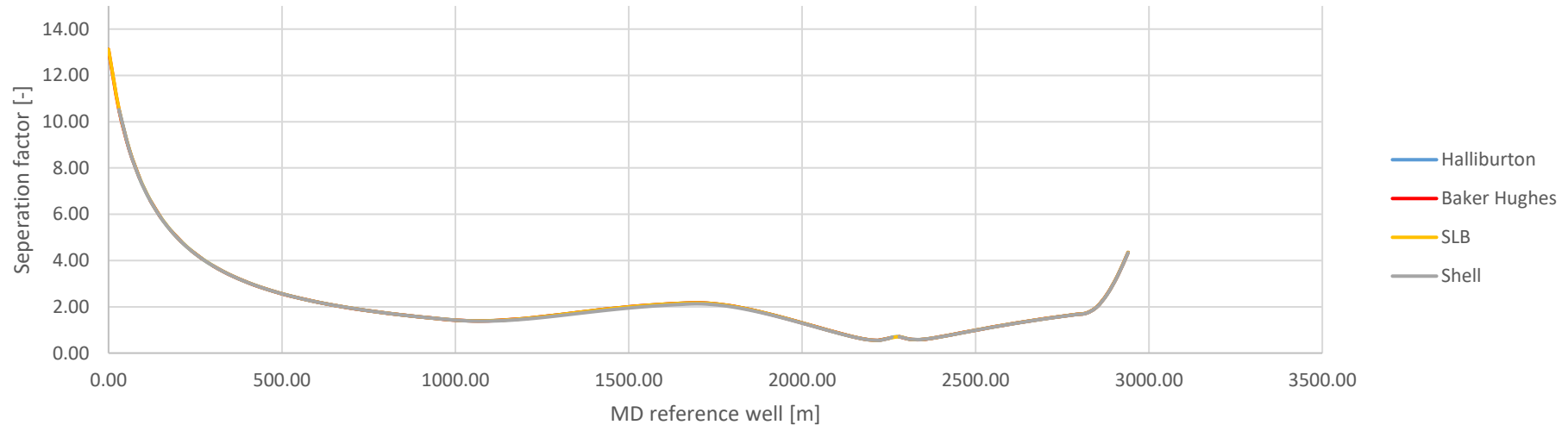


# Integrated Systems Validation

1. Well Setup – CRS – units – vert/horz datum references – Az refs
2. Well Trajectories – position calculation – plan interpolation
3. Relative trajectory positions
4. Error model – management – implementation
5. EOU calculation – error propagation – summation
6. Anti-collision analysis – 3D least distance
7. Separation Factor – Pedal Curve – AC rules
8. Probability Of Collision – PC distributions – vector blending

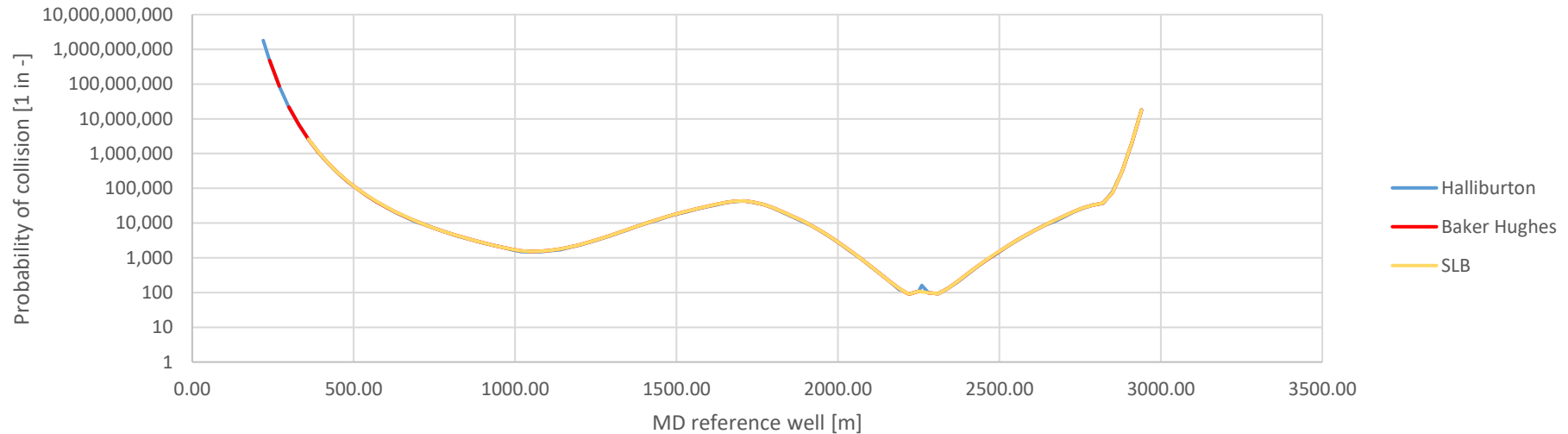
# Probability of Collision – 3 Software confirmation

## 03 - clearance comparison



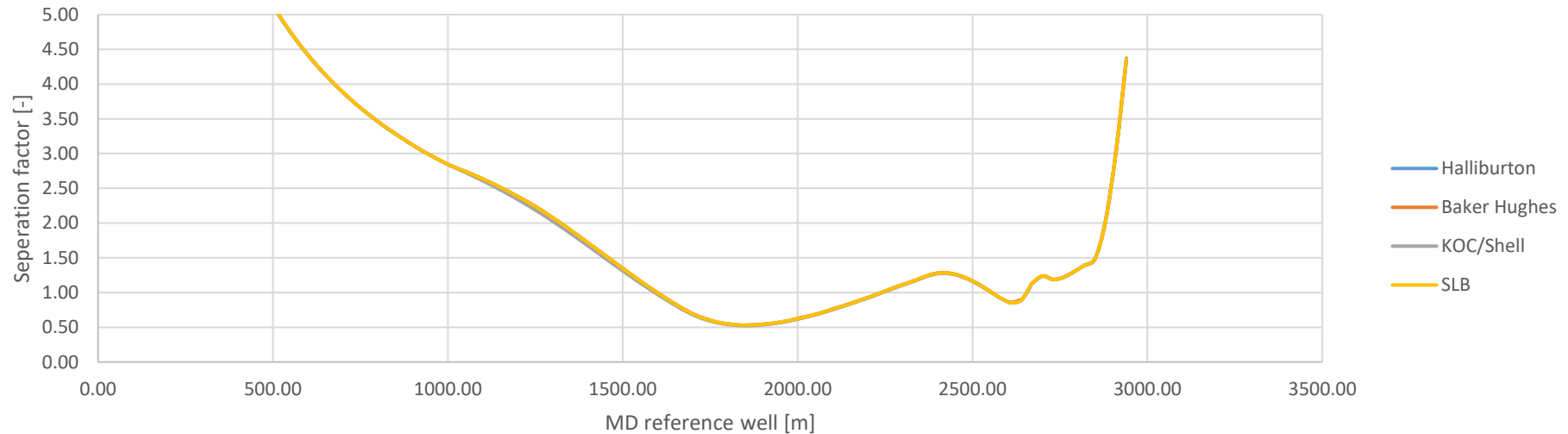
# Probability of Collision – 3 Software confirmation

03 - probability of collision - comparison



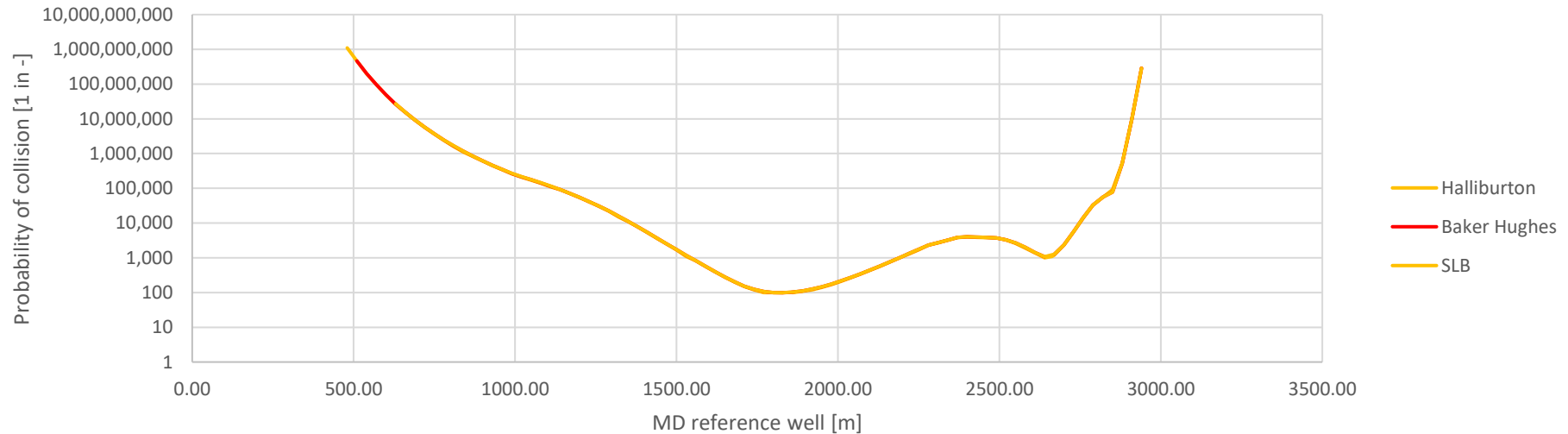
# Probability of Collision – 3 Software confirmation

04 - clearance comparison



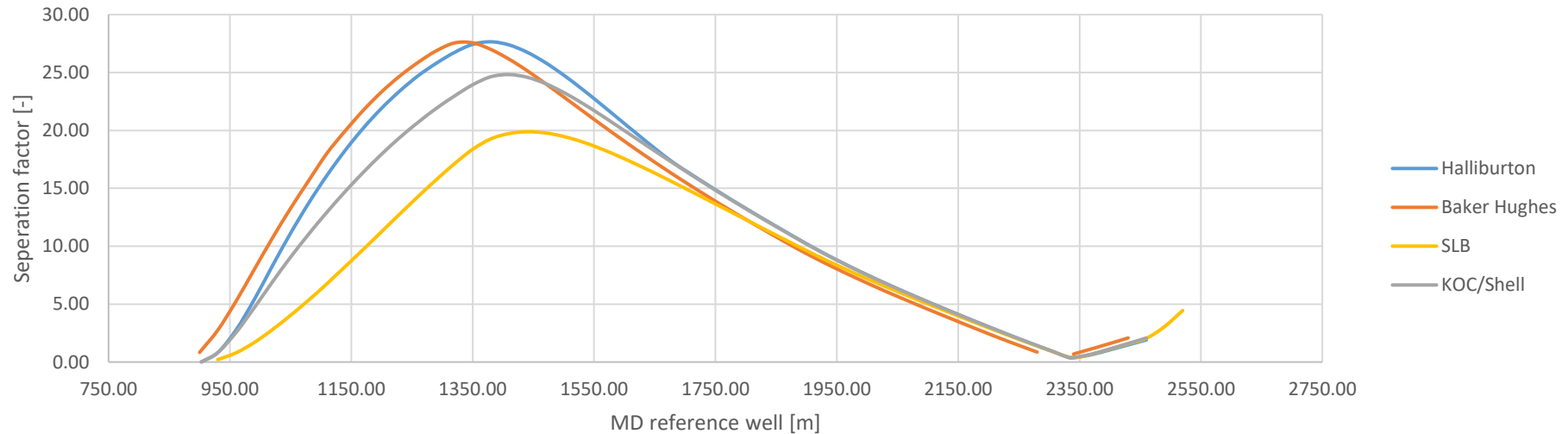
# Probability of Collision – 3 Software confirmation

04 - probability of collision - comparison



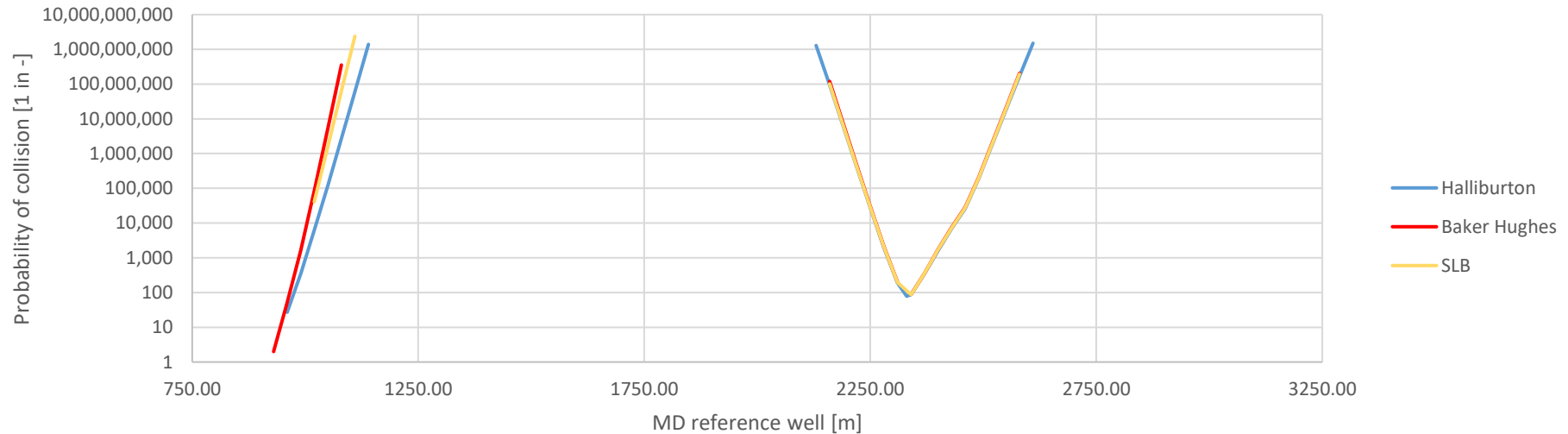
# Probability of Collision – 3 Software - Sidetrack

10 - clearance comparison



# Probability of Collision – 3 Software - Sidetrack

10 - probability of collision - comparison





# Probability of Collision - Freeze

- Focus is on getting a “common” tool available as a starting point
  - Freeze current development
  - 3 major software vendors now match results
    - Currently in software – availability depends on the vendor’s release procedures
  - Need to publish limitations/recommendations of when/how to be used
- Another tool in the toolbox for risk evaluation
  - Help make decisions on what to do next when SF violated
- PC reported with SF

# Risk-based collision avoidance procedure

- Step 1
  - Recognize the “C” hazard
- Step 2
  - Estimate consequence
- Step 3
  - Assess the severity
- Step 4
  - Estimate frequency
- Step 5
  - Risk estimation

|                                      |                             | Category                               | CONSEQUENCE ESTIMATION |       |        |       |        |
|--------------------------------------|-----------------------------|----------------------------------------|------------------------|-------|--------|-------|--------|
|                                      |                             | Consequence category is set by Company |                        |       |        |       |        |
| FREQUENCY ESTIMATION                 |                             |                                        |                        |       |        |       |        |
| Quantitative Interpretaiton Guidance | Quantitative Interpretation | Category                               | Negligible             | Minor | Modate | Major | Severe |
|                                      |                             | Very unlikely                          |                        |       |        |       |        |
|                                      |                             | Unlikely                               |                        |       |        |       |        |
|                                      |                             | Possible                               |                        |       |        |       |        |
|                                      |                             | Likely                                 |                        |       |        |       |        |
|                                      |                             | Frequent                               |                        |       |        |       |        |

**\* PC only focus on quantitative interpretation**

# Study: Utility PUM's for Collision Avoidance

- **Mike Attrell – Pacesetter Directional** [mattrell@pacesetterdirectional.ca](mailto:mattrell@pacesetterdirectional.ca)
- How Vertical is “Vertical”? : Unsurveyed Vertical Wellbores
- How can we handle unsurveyed vertical wellbores?
- Study: Use of “utility” PUMs for collision avoidance and risk identification
  - INC-ONLY\_PLAN / INC-ONLY / UNKNOWN
- **Objective:** Establish guidelines with repeatable processes for positional uncertainty modelling of unsurveyed vertical wellbores
  - Appropriately represent the uncertainty of unsurveyed vertical wellbores
  - Reward the addition of directional survey data
  - Ability to easily increase or decrease the modelled uncertainty for a given situation



# Continued Work –volunteers identified

1. Benchmarks Update Rev5 & WPTS & Sidetrack
  - Work in progress – post results from all major software vendors
  - Include PC results – Projected Vector / Direct Vector?
  - Include rev4/5 w/wo inter-well geomag reference correlations
  - Add expanded “setup” details – specific error models
2. Finalize CA Reporting minimum content standard
3. Website update posting of references documents



# New Initiatives

1. eBook – inventory/evaluation tasks
2. Recommendations on Graphics systems for CA and combined covariance representation – data requirements (link to minimum reporting)
  - Possible youth hackathon – for graphics visualization – new education/recruiting initiative
3. Update benchmarks to include “utility” error models
4. Update original CA document – Current Common Practice (2017)



# Thank You – Questions? Corrections?

[aklestad@slb.com](mailto:aklestad@slb.com)