



Minutes of the  
Twenty First  
Meeting of the



**Industry Steering  
Committee on  
Wellbore Survey  
Accuracy**

**And**

**SPE Wellbore  
Positioning  
Technical Session**

Oslo, Norway  
May 27th 2004

Attendees:

<b>Name</b>	<b>Company</b>	<b>E-Mail</b>
Andy Brooks	Baker Hughes	<a href="mailto:andrew.brooks@bakerhughes.com">andrew.brooks@bakerhughes.com</a>
Harry Wilson	Baker Hughes	<a href="mailto:harry.Wilson@inteq.com">harry.Wilson@inteq.com</a>
Phil Harbidge	Baker Hughes	<a href="mailto:Phil.harbidge@inteq.com">Phil.harbidge@inteq.com</a>
Inge Edvardsen	Baker Hughes	<a href="mailto:Inge.edvardsen@inteq.com">Inge.edvardsen@inteq.com</a>
David Kerridge	BGS	<a href="mailto:djk@bgs.ac.uk">djk@bgs.ac.uk</a>
Matthew Rhodes(*)	BP	<a href="mailto:rhodesm1@bp.com">rhodesm1@bp.com</a>
Ian Farmer	BP	<a href="mailto:ian.farmer@bp.com">ian.farmer@bp.com</a>
Ed Stockhausen	ChevronTexaco	<a href="mailto:edjs@chevron.com">edjs@chevron.com</a>
Mike Herbert	ConocoPhillips	<a href="mailto:mike.herbert@conocophillips.com">mike.herbert@conocophillips.com</a>
Steve Grindrod	CopseGrove	<a href="mailto:steve@copsegrove.co.uk">steve@copsegrove.co.uk</a>
Allan Clark	Geolink MWD	<a href="mailto:a.clark@geolink.co.uk">a.clark@geolink.co.uk</a>
Steve Mullin(**)	Gyrodata	<a href="mailto:stevem@gyrodata.com">stevem@gyrodata.com</a>
Roger Ekseth	Gyrodata	<a href="mailto:rogere@gyrodata.com">rogere@gyrodata.com</a>
Lill-Tove Andreassen	Halliburton	<a href="mailto:Lill-tove.andreassen@halliburton.com">Lill-tove.andreassen@halliburton.com</a>
Katrine Wienberg	Maersk	<a href="mailto:kwi@maerskoil.dk">kwi@maerskoil.dk</a>
Henrik Wolter	Norsk Hydro	<a href="mailto:Henrik.wolter@hydro.com">Henrik.wolter@hydro.com</a>
John Turvill	Paradigm	<a href="mailto:jturvill@paradigmgeo.com">jturvill@paradigmgeo.com</a>
Phil Dickson	Paradigm	<a href="mailto:phild@paradigmgeo.com">phild@paradigmgeo.com</a>
Alan Heath	Pathfinder	<a href="mailto:Alan.heath@pathfinder-ltd.co.uk">Alan.heath@pathfinder-ltd.co.uk</a>
Kevin McClard	Performance Drilling	<a href="mailto:Winsurv3d@sbcglobal.net">Winsurv3d@sbcglobal.net</a>
Paul Maton	POSC	<a href="mailto:maton@posc.org">maton@posc.org</a>
Maria Dahle	Roxar	<a href="mailto:Maria.dahle@roxar.com">Maria.dahle@roxar.com</a>
Hugues Thevoux-Chabuel	Roxar	<a href="mailto:hthevoux@roxar.com">hthevoux@roxar.com</a>
Benny Poedjono	Schlumberger	<a href="mailto:poedjono1@slb.com">poedjono1@slb.com</a>
Brett van Steenwyk	Scientific Drilling	<a href="mailto:bvanstee@ata-sd.com">bvanstee@ata-sd.com</a>
Tim Price	Scientific Drilling	<a href="mailto:tprice@ata-sd.com">tprice@ata-sd.com</a>
Wulf Luther	SEG	<a href="mailto:wluther@welconsult.com">wluther@welconsult.com</a>
Gerard Hohner	SEG	<a href="mailto:segmunich@compuserve.com">segmunich@compuserve.com</a>
Andy McGregor	Selex	<a href="mailto:Andrew.mcgregor@baesystems.com">Andrew.mcgregor@baesystems.com</a>

Paul Lawton	Selex	<a href="mailto:Paul.lawton@baesystems.com">Paul.lawton@baesystems.com</a>
Iain Scott	Shell	<a href="mailto:iain.scott@shell.com">iain.scott@shell.com</a>
John Macgregor	Shell	<a href="mailto:j.macgregor@shell.com">j.macgregor@shell.com</a>
Dave McRobbie	Sperry Sun	<a href="mailto:dave.mcrobbie@halliburton.com">dave.mcrobbie@halliburton.com</a>
William Allen	Sperry Sun	<a href="mailto:william.allen@halliburton.com">william.allen@halliburton.com</a>
Anne Holmes	Sperry Sun	<a href="mailto:Anne.holmes@halliburton.com">Anne.holmes@halliburton.com</a>
Carl Ulrich	Sperry Sun	<a href="mailto:Carl.ulrich@halliburton.com">Carl.ulrich@halliburton.com</a>
Stein Havardstein	Statoil	<a href="mailto:steint@statoil.com">steint@statoil.com</a>
Torgeir Torkildsen	Statoil	<a href="mailto:totor@statoil.com">totor@statoil.com</a>
Erik Nyrnes	Statoil	<a href="mailto:Erik.nyrnes@ntnu.no">Erik.nyrnes@ntnu.no</a>
Ross Lowdon	Tech 21	<a href="mailto:ross@tech21.co.uk">ross@tech21.co.uk</a>
Angus Jamieson	TECH21	<a href="mailto:T21es@aol.com">T21es@aol.com</a>
Steve Holehouse	TOTAL	<a href="mailto:Steve.holehouse@total.com">Steve.holehouse@total.com</a>
Romain Gareaux	Total	<a href="mailto:Romain.gareaux@total.com">Romain.gareaux@total.com</a>
Regis Studer	Total	<a href="mailto:Regis.studer@total.com">Regis.studer@total.com</a>
Mike Nero	Weatherford	<a href="mailto:Mike.nero@weatherford.com">Mike.nero@weatherford.com</a>

\* Chair

\*\* Minutes

1. Torgeir Torkildsen welcomed everyone to Oslo. He explained the emergency instructions for the building and outlined the timings for breaks and meals for the day.
2. Matthew Rhodes opened the meeting and asked Steve Mullin to review the agenda for the day.
3. Steve reviewed the agenda for the day and also presented the locations and hosts for the 21 meetings to date. It was agreed that the list should have future meetings added to keep it up to date.



Hosts & Locs

4. Steve outlined an idea proposed by John Thorogood of BP that the committee should consider organizing a SPE Applied Technology Workshop on the subject of Collision Avoidance. Steve explained that John was unable to attend the meeting due to work demands in Sakhalin. Through discussion it became clear that the majority of the group felt that collision avoidance was too specific a subject for a first ATW. It was decided that a more general workshop on wellbore positioning should be explored. The following volunteered to be on the organizing committee:

Angus Jamieson – Tech 21  
 Benny Poedjono – Schlumberger  
 Ed Stockhausen – Chevron  
 Bill Calhoun – Chevron (not present volunteered by Stockhausen)  
 John Turvill – Paradigm  
 Ian Farmer – BP  
 Dave McRobbie – Halliburton  
 Regis Studer – Total  
 Katrine Wienberg – Maersk  
 Steve Mullin – Gyrodata

5. Angus Jamieson started the meeting with a presentation on work he carried out for Weatherford on the subject of survey mathematics.



Jamieson 1

6. Angus Jamieson introduced Dr. Andy McGregor of Selex who gave a very interesting presentation on the TRIPS inertial navigation system. Unfortunately Andy's presentation contained some military references and therefore cannot be distributed.

7. Roger Ekseth addressed the meeting on the idea of forming a new sub-committee for the purpose of validating company specific error models.



Ekseth 1

Roger stated that there are 4 error models approved by ISCWSA but there are many more referred to by service suppliers as ISCWSA models but the committee has no control over these. Roger volunteered to chair the new sub-committee if it is formed. Dave McRobbie questioned the purpose, he said Sperry already have procedures in place that ensure their error models are valid. Regis Studer put forward the example that he believes that in many cases SAG correction is not dealt with correctly. Harry Wilson supported the principle of the suggestion but doubted that the effort would produce globally accepted results. John Turvill questioned if Roger was proposing the development of a methodology to validate error models, Roger confirmed this would be one of the outcomes. General discussion about gross errors and the need for standard operational procedures to detect them followed. Togeir stated that Statoil fully supports the proposal and will give assistance to Roger. Ian Farmer said B.P. would support the effort and provide data. Ed Stockhausen offered Chevron's participation.

8. Steve Grindrod gave a presentation to support his statement that many implementations of the ISCWSA model are wrong due to a misinterpretation of the paper.



Grindrod 1

9. Harry Wilson addressed the committee on the subject of stewardship of the error model. He proposed the establishment of a standing sub-committee responsible for ongoing stewardship of the error model. The main duties of the sub-committee would be to approve any changes to the model and decide when revisions should be issued. Harry's formal proposal is in the following Word document.



Wilson 1

The following volunteered for the standing sub-committee:

Ian Farmer – B.P. (Chair)

Andy Brooks – Baker Hughes  
Steve Grindrod – Copsegrove  
Anne Holmes – Sperry Sun  
Mike Nero – Weatherford  
Paul Maton – POSC (Associate)

10. Paul Maton of POSC updated the committee on the work and plans of POSC.
11. Bill Allen (Web Master) asked the group to provide him with feedback on improvements or changes to the website. There was some discussion on access to the website for non SPE members; Bill promised to take this subject up with SPE once again. Ed Stockhausen requested a link to Bill's e-mail address be included in the minutes, [william.allen@halliburton.com](mailto:william.allen@halliburton.com). Harry mentioned that the old website is still up, John Turvill said he would speak to Robert Wylie about shutting it down.
12. Erik Nyernes presented his thesis on detection of gross errors.



Nyernes 1

13. Stein Havardstein made a presentation on the subject of independent QC of MWD surveys.



Havardstein 1

14. Romain Gareaux presented on comparisons between constant toolface and minimum curvature methods.



Gareaux 1

15. Regis Studer addressed the committee on his concerns regarding current BHA sag correction methods. Regis would like to see the development and implementation of 3D sag correction methods. He further stated that he believes the ISCWSA error model parameters for sag correction are not justifiable.

16. Gerry Hohner made a presentation on the Target inertial navigation system. The system is currently available as a 1.75" diameter wireline system. SEG are currently working on the development of a "drop" version.



Hohner 1

17. Steve Holehouse reported on the work of the depth sub-committee. The sub-committee have authored an SPE paper titled "Quantification of Depth Accuracy" that will be published at the SPE meeting in Dallas in October. Steve provided copies of the draft paper for review and comment.



Holehouse 1

18. Ed Stockhausen reviewed the discussions of the survey interval group. Harry Wilson expressed his opinion that slide rotate pattern errors need to be dealt with by standard operational procedures because they can't be adequately modelled for inclusion in the error model. The majority of those present agreed.
19. Torgeir asked the gyro and software companies to briefly report on the status of their implementation of the gyro error model:

**Gyrodata** – Full in house implementation for all tools. Error parameters distributed and implemented into Director, Compass and Well Architect programs.

**Scientific Drilling** – Very close to having error parameters ready.

**INTEQ** – Implemented into Director and Well Architect, error parameters for RIGS and Seeker provided in this document:



INTEQ 1

**Paradigm** – Implemented and in reasonable compliance. Gyrodata error parameters installed and now being distributed to clients.

**Roxar** – Late starter but now working on implementation.

### **Other Business**

1. It was agreed that the next meeting should coincide with the SPE ATCE in Dallas, 9-12 October. John Turvill volunteered to arrange the meeting.
2. A vote for the election of a new chairperson to replace Matthew Rhodes was taken. Matthew has a new day job and his future responsibilities at BP make it impractical for him to continue as chairman. After adding the e-mail votes to those cast at the meeting **Angus Jamieson** of Tech 21 was duly elected, winning 42% of the total votes cast.
3. The meeting closed following the presentation of a small momentum to Matthew.

On behalf of the entire committee I would like to record in the minutes our thanks to Matthew for his tireless efforts while chairman. We wish you good luck in the future and hope that eventually you will find an establishment willing to take your BP credit card.