

**Marine Technology Society**

Dynamic Positioning Conference

21-22 October, 1997

**Session 8**

**Position, Environment and Attitude Sensors**

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**Gyros, Riser Angle (ERA) and Taut**

By: Asmund Henriksen

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**Session Planner**

Tony Wood: *John Chance & Associates Houston*



**KONGSBERG**  
SIMRAD

**DYNAMIC POSITIONING CONFERENCE  
HOUSTON, OCTOBER 21 - 22, 1997**

**BY ASMUND HENRIKSEN  
KONGSBERG SIMRAD AS**

- **GYRO COMPASS,**
- **ELECTRICAL RISER ANGLE (ERA),**
- **TAUT WIRE**
  - The nature of the signals, interfacing and how they are applied in the Kongsberg Simrad Dynamic Positioning Systems.
  - Experience.

**GYRO COMPASS**

- *UPDATE RATE: 1 SECOND*
- *NORTH RELATIVE MEASUREMENTS*
- *RS 232C SERIAL LINE NMEA 0183 FORMAT  
OR SYNCHRO (400 HZ)*
- *ALARM SIGNAL*
- *AUTOMATIC SPEED AND LATITUDE CORRECTION*

**GYRO COMPASS**

- *PART OF NAVIGATION EQUIPMENT SET-UP*
- *MANY MAKERS AND TYPES GYRO COMPASS*
- *FED TO ALL DP CONTROLLERS*
- *TWO COMPASSES: COMPARISON CHECK*
- *THREE COMPASSES: MAJORITY VOTING = MEDIAN VALUE*

**GYRO COMPASS EXPERIENCE:**

- *FOR NORMAL DP OPERATION COMPASSES COMPLYING WITH IMO  
RESOLUTION 424 (XI) PROVIDE SATISFACTORY ACCURACY AND  
RESPONSE*

**RISER ANGLE (ERA)**

- *RS 232C OR ANALOGUE OUTPUT*
- *ANGLE TRANSFORMATION TO N/E COORDINATES*
- *UPDATE RATE: 1 SECOND*

**RISER ANGLE (ERA)**

- *PREDICTION OF ZERO-ANGLE-POSITION  
- A "CARROT-FUNCTION"*
- *ADVISORY BASED ON STRAIGHT LINE ASSUMPTION*
- *RISER ANGLE ALARM LIMIT*

**RISER ANGLE (ERA) EXPERIENCE:**

- *UNRELIABLE AS POSITIONING REFERENCE SYSTEM DUE TO:*
  - *UNKNOWN RISER PROFILE*
  - *LONG RESPONSE TIME (MINUTES)*

**TAUT WIRE**

- *MECHANICAL SYSTEM - SIMPLE AND ROBUST*
- *LIMITED ALLOWANCE FOR POSITION AND HEADING CHANGES*
- *UNLINEAR SCALE VERSUS ANGLE DUE TO WIRE PROFILE*
- *DEPTH LIMITATION*

**TAUT WIRE**

- *ANALOGUE OUTPUT, ATHWARTSHIP AND ALONGSHIP COORDINATES*
- *ALARM AND ANGLE LIMIT SIGNALS*
- *ROLL AND PITCH COMPENSATION*
- *TRANSFORMATION TO NORTH/EAST COORDINATES*

**TAUT WIRE ADVANTAGES:**

- *SIMPLE AND ROBUST SYSTEM*
- *LOW NOISE SIGNALS*

**TAUT WIRE DISADVANTAGES:**

- *LIMITED ALLOWANCE FOR POSITION AND HEADING CHANGES*
- *WIRE PROFILE AFFECTED BY ANGLE AND CURRENT*
- *UNLINEAR SCALE VERSUS ANGLE*
- *DEPTH LIMITATION*

**TAUT WIRE EXPERIENCE:**

- *RELIABLE TO 500 METERS W.D. WITH FILTER*
- *REQUIRE PERIODIC MAINTENANCE*