

# Radar and TDR in side gauges used for level and interface



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Dow 1987 →

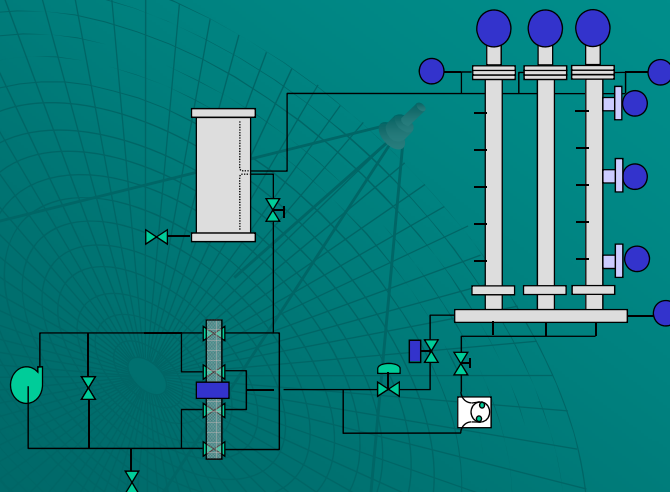
BITS 2004 →



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1

## Phase III - Level test rig



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2

## Participants

- ◆ Emerson
- ◆ Endress+Hauser
- ◆ Krohne
- ◆ Magnetrol
- ◆ Siemens
- ◆ Vega

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3

## Radar in side gauges

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| 1. Accuracy                      | 9. Mounting position                |
| 2. Sensitivity                   | 10. Start-up drift                  |
| 3. Environmental tests           | 11. Minimum/maximum level detection |
| 4. Fluid temperature             | 12. Empty vessel detection          |
| 5. Condensation                  | 13. Output signal interference      |
| 6. Influence of different fluids | 14. Output load                     |
| 7. <u>Surface foam</u>           | 15. Digital communication           |
| 8. Gas bubbles                   | 16. Dynamic behaviour               |

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4

## TDR for level in side gauges

1. Accuracy
2. Sensitivity
3. Environmental tests
4. Fluid temperature
5. Condensation
6. Influence of different fluids
7. Surface foam
8. Gas bubbles
9. Mounting position
10. Start-up drift
11. Minimum/maximum level detection
12. Empty vessel detection
13. Output signal interference
14. Output load
15. Digital communication
16. Dynamic behaviour

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5

## TDR for interface

1. single phase accuracy
2. emerging top liquid
3. emerging bottom liquid
4. settling of emulsion, top layer
5. settling of emulsion, interface
6. overflow

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6

## Trends:

- complexiteit
  - systeem
  - gebruik
- goedkoper
- kleiner
- hogere frequentie
- hogere drukken en temperaturen
- varieteit in antenne ontwerpen
- 4—> 2 draads
- acceptatie pendulum
- voor vloeistoffen: vrij straaals→ TDR
- vaste stoffen: TDR→ vrij straaals.

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7