

ICON

otm

Intelligent Completions on the Net

**SPE ATW In-well Optical Sensing
Subsea Applications – Are we Ready?**

Moody Gardens, Galveston

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Agenda

The logo for otm, consisting of the lowercase letters 'otm' in a white, sans-serif font, centered within a solid red square.

1. Introduction to ICON
2. ICON Performance Analysis
3. What about subsea?
4. Questions

Introduction to ICON

ICON – Intelligent Completions on the Net

- aim of developing an accurate and relevant global knowledge resource on intelligent completions

Delivered through a web portal (www.icon-project.com)

- profiles over 2400 downhole sensors and gauges (including fibre optic) installed in over 350 fields around the world over the last 17 years.
- Offers performance data, reliability analysis and survival probability statistics for key IWC components.
- Updated/ Validated annually

Suppliers and oil companies alike are encouraged to provide data to the database as a means to help demonstrate and promote the growth of all in-well sensing systems.



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Objectives of ICON

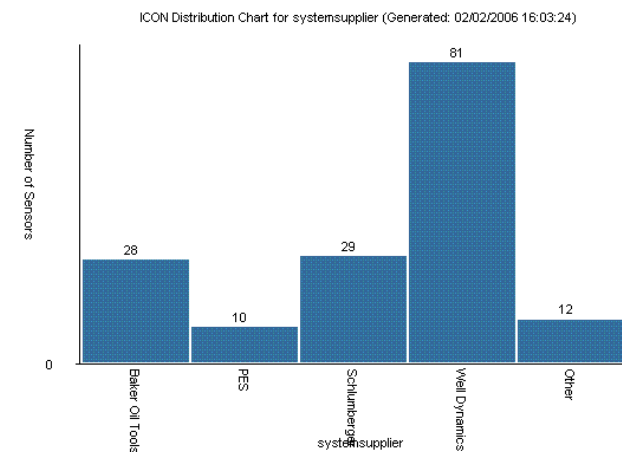
The logo for otm, consisting of the lowercase letters 'otm' in white on a red square background.

- To enable operators to see what combinations of technologies have been successfully run in the past
- To create confidence in IWC technology & aid justification of future installations
- To facilitate reliability analysis and improvement thereby allow operators to make better decisions on issues of functionality/ design/ installation
- Provide suppliers with increased market and general feedback on own systems



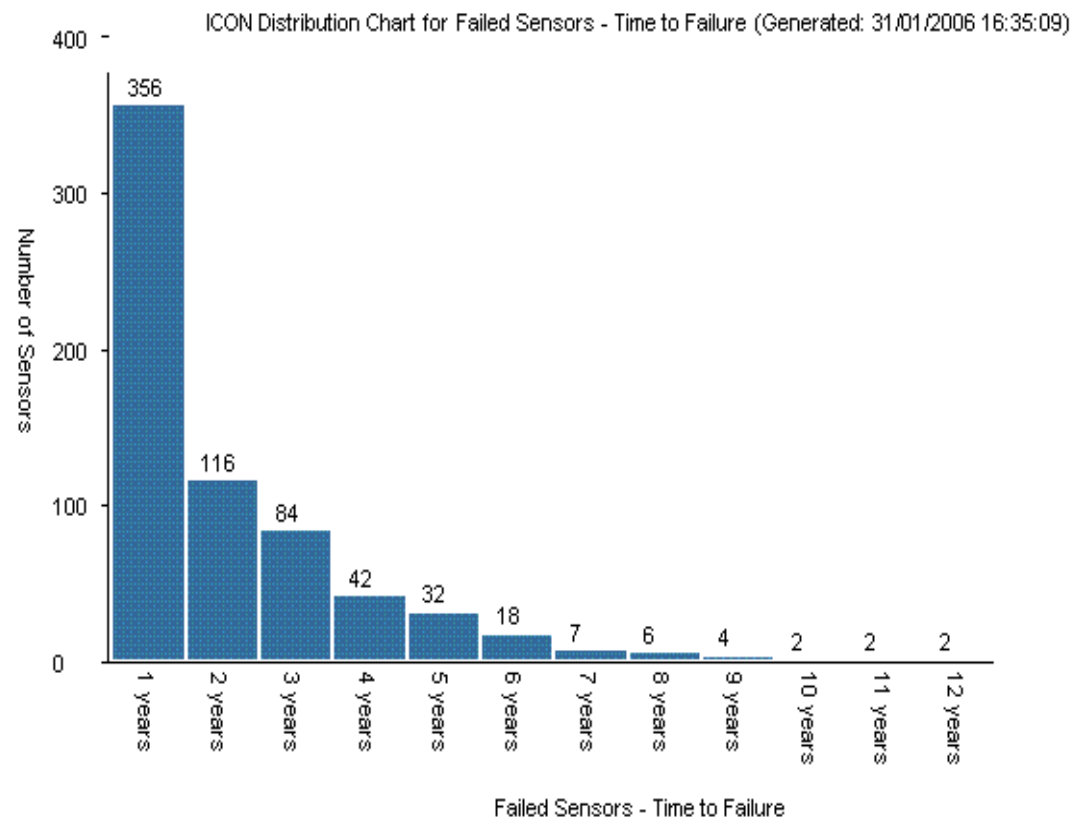
ICON Structure:

- Up to 165 parameters per IWC
 - Ownership data
 - Well data
 - Zone data
 - IWC (flow control system) data
 - Valve data
 - String data
 - Cables & control lines data
 - Sensor (permanent downhole gauge) data
- IWC Installations: 164 systems
- Gauge/Sensor only installations: 2418
- Subsea installations: 800 +
- Performance/ Reliability data



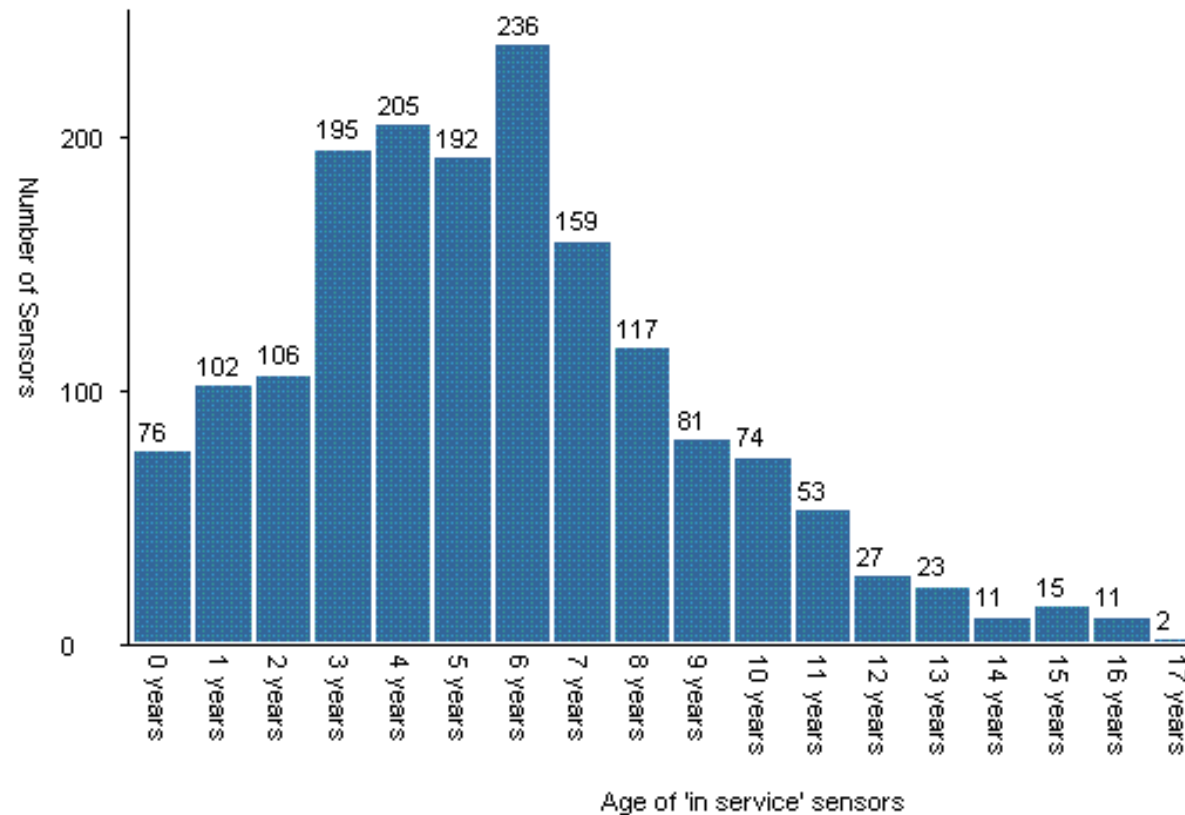
Reliability data gathered in accordance with:
ISO 14224 Petroleum and natural gas industries – collection and exchange of reliability and maintenance data for equipment.

- More than 15% of ALL ICON sensors/gauges failed in the first year
- Average life of ICON 'failed' sensor: 2 yrs, more than 50% fail in first year
- Typical Failure causes: cable, connectors, short circuit,...



- 50% of ICON 'operational' sensors lasted > 5 years

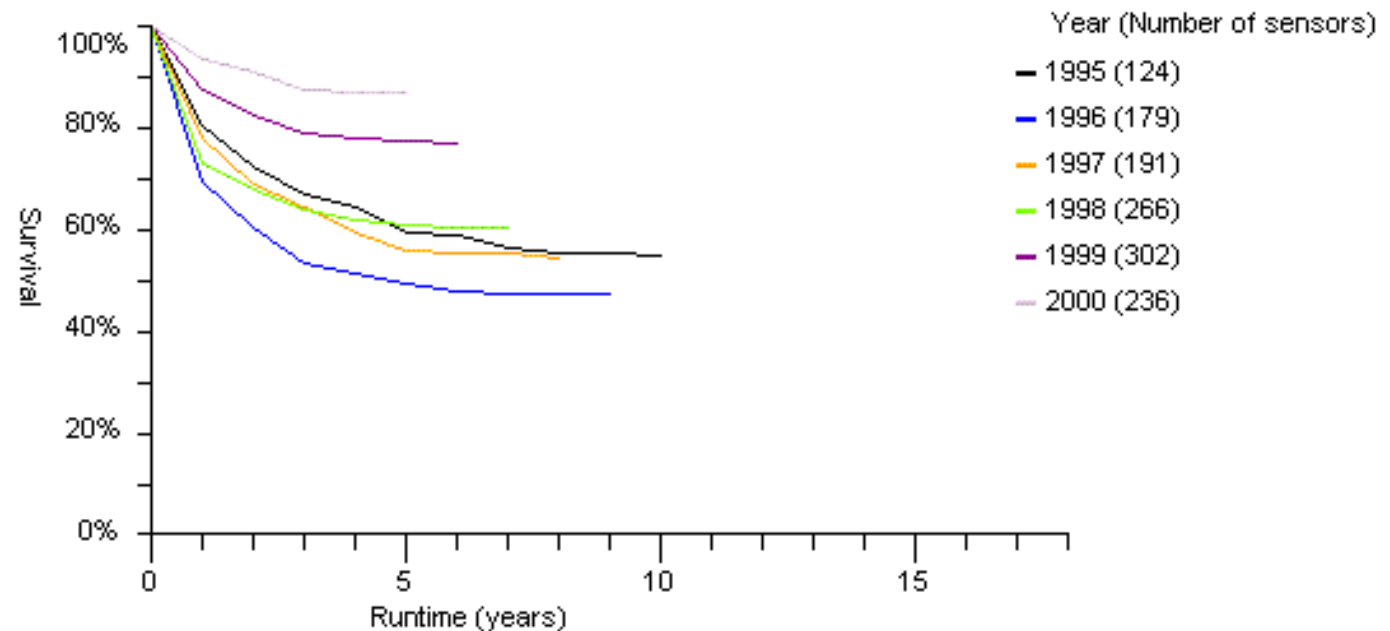
ICON Distribution Chart for Age of 'in service' sensors (Generated: 31/01/2006 16:34:02)



- ICON sensors installed pre 1999: 60% survival probability after 5 yrs
- ICON sensors installed 1999, 2000: 80% survival probability after 5 yrs

ICON Data: Survival probability of downhole sensors against runtime

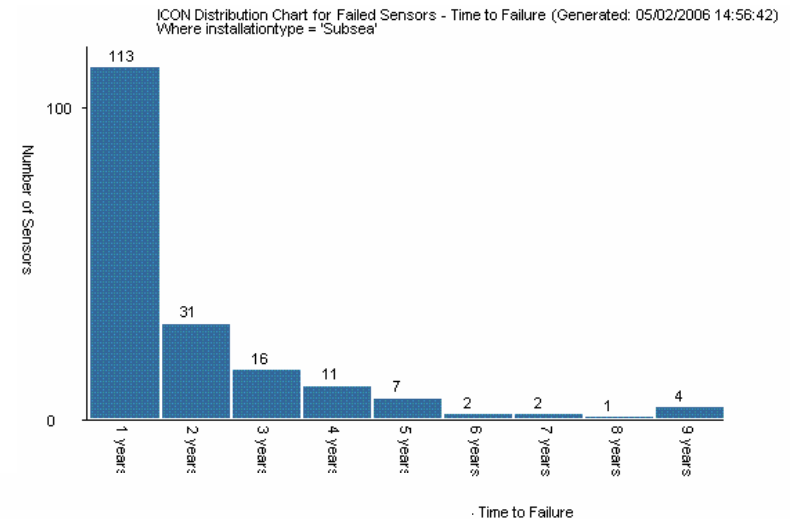
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What about subsea?

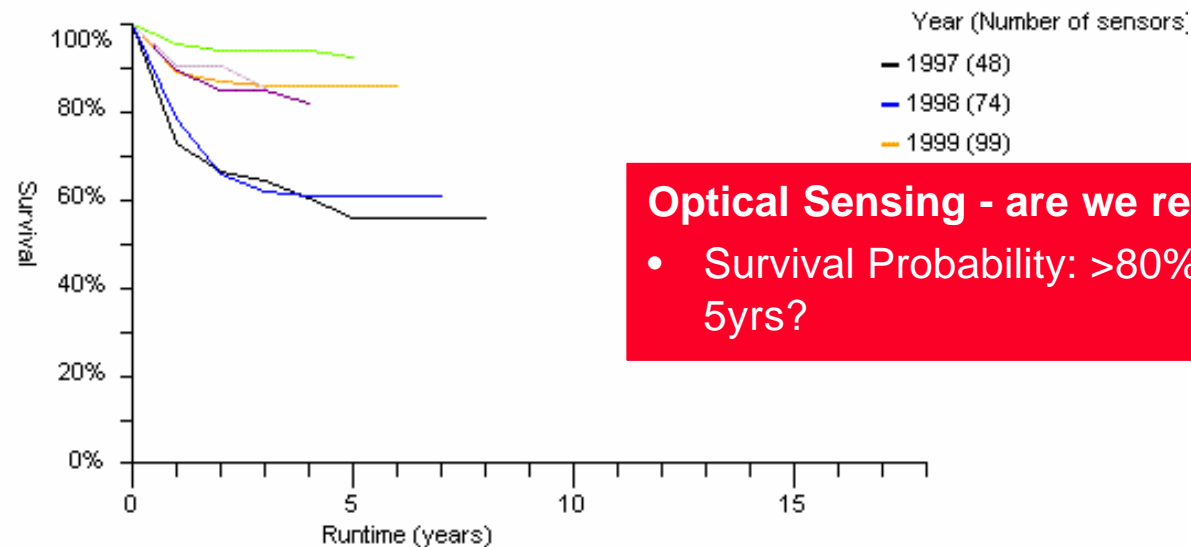
Installation of in-well subsea sensors

- Subsea : 811
- 25% have failed to date
- Significant improvement in survival probability since 1999



ICON Data: Survival probability of downhole sensors against runtime

Where installationtype = 'Subsea'
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Optical Sensing - are we ready?

- Survival Probability: >80% after 5yrs?

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Questions?

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ICON Meeting - 8am Thu 9th Feb 2006 - Moody Gardens



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ICON Members



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BG Group - Ashutosh Shah, Lotfi Trabelsi

BP - John Marshall

Chevron - Brian Llewellyn, Mike Kendrick

ConocoPhillips - Trey Gilbert

Shell - Rob Baird

Statoil - Lars Vinje

Total – Jany Suzanne, Herbert Lescanne

Quartzdyne - Lon Perry

Wood Group - David Blacklaw, Mark Thomas