



2018 European Subsea Sensors for Well Integrity  
Product Leadership Award

F R O S T & S U L L I V A N

2018

BEST  
PRACTICES  
AWARD

EUROPEAN  
SUBSEA SENSORS FOR WELL INTEGRITY  
PRODUCT LEADERSHIP AWARD

2018  
BEST PRACTICES  
AWARDS

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## Background and Company Performance

### *Industry Challenges*

Companies have steadily developed the oil industry while expanding production from onshore reserves to inland waterways and then to offshore to meet the rise in energy demand. The offshore drilling industry has grown consistently over the decades, producing 1 million barrels per day in the late 1950s to one-third of the total crude oil production globally, currently. Energy demand increases and the decline in recovery rate among existing wells expect to drive subsea exploration; thus, actively driving the subsea equipment market.<sup>1</sup>

Nevertheless, huge investment costs stand as an obstacle to the growth of the subsea equipment market. Energy companies are continuously focusing on pioneering technologies and techniques to enhance project safety. The oil and gas industry has identified high-risk parts of the extraction process, including the power delivery system and intervention cost. Furthermore, the hostile environments at such deep water necessitate the need for innovative solutions. Companies are strongly investing in research and development to build systems that enhance efficiency and safety. Thus, the high costs associated with developing technology and solutions for establishing a safe and secure subsea project can limit the market growth.<sup>2</sup>

With reduced investment levels and the need to improve competitiveness in the offshore oil and gas industry, oil production of the future will rely more on increased oil recovery from existing subsea wells and assets. Oil companies rely on doing heavy intervention work and drilling side steps on existing wells. This approach poses a challenge to the industry as the wells have not been designed for the loads imposed from repeated rig operations. Additionally, the size of modern drilling rigs and drilling equipment has more than doubled since the 1980's, and the rig loads on a well have increased even more, exacerbating the weight problem.

The industry has not prioritized robust and operational solutions for monitoring the wellhead loads during rig operations, and it has lacked robust tools to assess the structural fatigue exposed to wells. The industry needs more capable algorithms and sensors that enable users to detect structural failures in the wellhead early enough and in time to take mitigating actions before a critical situation occurs.

Frost & Sullivan believes that with new fields discovered in offshore regions, the declining recovery rate, and production from aging fields, innovative solutions that ensure wellhead integrity and increase operational efficiency will be an imperative going forward for oil and gas producers.

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<sup>1</sup> *Analysis of the Global Subsea Equipment Market*, (Frost & Sullivan, June 2014)

<sup>2</sup> *Analysis of the Global Subsea Equipment Market*, (Frost & Sullivan, June 2014)

## *Product Family Attributes and Business Impact of 4Subsea*

### **Subsea Wellhead Integrity Monitoring (SWIM)—Best-in-Class Solution for Well Integrity**

Founded in 2007, 4Subsea is a Norway-based company that specializes in providing technology and services for riser systems and subsea well systems. By leveraging a strong academic background, a focus on details, and practical offshore experience, 4Subsea stands at the forefront of digitizing oil, gas, and offshore wind operations worldwide through its innovative digital platform. To maximize the value of well slots and to reduce the rig operations costs, 4Subsea developed the Subsea Wellhead Integrity Monitoring (SWIM) solution that enables operators to carry out heavy intervention work on old wells. The solution mitigates risk and provides well operators with a tool to detect wellhead integrity issues during a rig operation early enough to take corrective actions before a critical situation arises. By instrumenting a blowout preventer with three autonomous sensors, SWIM monitors well integrity, well stability, as well as the load applied from the rig onto the wellhead, including fatigue loading on the wellhead.

The key differentiating factor of SWIM is the cost-efficient and robust nature of the solution where it eliminates the need for cables that can potentially fail and require additional personnel on the rig. Since it omits the cable to surface, SWIM users do not experience any sensor failures and do not need to perform any form of data filtering or cleaning before running algorithms on the data.

The unique feature of SWIM is its machine learning module complemented by decision support tools. It provides predictive recommendations to the rig crew based on expected loading on the well ahead in time as well as on weather forecasts. The solution is also used extensively for exploration and production drilling of new wells where the conditions are such that rig loads are critical or where seabed conditions are challenging for well stability. The cost of drilling an exploration well is extremely high in such environments, thus, the value of introducing a solution that mitigates the well abandonment risk due to excessive rig loads or well stability issues is significant.

Another feature that provides a competitive edge for 4Subsea is the fact that SWIM comes with access to WellTrack, which is a set of digital apps that help operators assess the criticality of old wells, help them plan new rig operations, and assess the effects of choosing to do the operation with one particular rig versus another. Verified equipment data and operational history ensured by WellTrack provides better decision-making support, allows for extended service life, and secures optimal production from the wells.

## Creating Awareness and Value for Customers

Leveraging its solutions for well integrity, 4Subsea pays special attention to effective customer engagement while remaining focused on providing maximum client value. The company believes that supporting customers through technical and maintenance support calls simply are not sufficient in today's environment. Unlike the tradition solution providers, 4Subsea's customers receive strategic and proactive support to maximize their performance. 4Subsea produces agile products; meaning, each new idea is built and released as a minimum viable product for customers to test. Only after receiving customers' feedback does the company develop and evolve the product.

4Subsea pays significant attention to strengthening its brand as "geeky specialists" who combine strong engineering expertise, detailed domain knowledge and research with operational experience, digital solutions, and autonomous sensor technology. The company creates awareness of its innovative solutions while actively taking part in various conferences, events, research and joint industry projects, and keen to publish the research results to help bring the industry forward concerning applying new technologies.

In 2017, 4Subsea witnessed remarkable success, as SWIM grew from 2 rigs in continuous operation (on average) to 6 rigs in continuous operation (on average). For next year the company budgeted with another 60% growth (10 rigs in continuous operation on average) and already by end December 2017 the company is ahead of target with 11 rigs in operation. This strong growth is mainly due to the commercial competitiveness of the solution, its high quality, and robust solution set. Also, the company has plans to strengthen its geographic reach, while continuing to ensure best-in-class quality and around-the-clock technical support.

## Conclusion

Responding to growing demands from oil and gas industries for efficient operational solutions for monitoring the wellhead loads during rig operations, 4Subsea developed its robust Subsea Wellhead Integrity Monitoring (SWIM) solution. SWIM enables efficient performing of offshore drilling and intervention operations safely while optimizing the costs of rig operations. The WellTrack application strengthens the SWIM solution with significant decision-making support for operators while reducing risks and supporting operations.

With its innovative SWIM solutions and strong overall performance, 4Subsea earns Frost & Sullivan's 2018 Europe Product Leadership Award in subsea sensor marker for well integrity.

## Significance of Product Leadership

Ultimately, growth in any organization depends upon customers purchasing from a company and then making the decision to return time and again. A comprehensive product line, filled with high-quality, value-driven options, is the key to building an engaged customer base. To achieve and maintain product excellence, an organization must strive to be best-in-class in three key areas: understanding demand, nurturing the brand, and differentiating from the competition.



## Understanding Product Leadership

Demand forecasting, branding, and differentiating all play a critical role in finding growth opportunities for your product line. This three-fold focus, however, must be complemented by an equally rigorous focus on pursuing those opportunities to a best-in-class standard. Customer communications, customer feedback, pricing, and competitor actions must all be managed and monitored for ongoing success. If an organization can successfully parlay product excellence into positive business impact, increased market share will inevitably follow over time.

## *Key Benchmarking Criteria*

For the Product Leadership Award, Frost & Sullivan analysts independently evaluated two key factors—Product Family Attributes and Business Impact—according to the criteria identified below.

### **Product Family Attributes**

- Criterion 1: Match to Needs
- Criterion 2: Reliability and Quality
- Criterion 3: Product/Service Value
- Criterion 4: Positioning
- Criterion 5: Design

### **Business Impact**

- Criterion 1: Financial Performance
- Criterion 2: Customer Acquisition
- Criterion 3: Operational Efficiency
- Criterion 4: Growth Potential
- Criterion 5: Human Capital



## Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 <b>Monitor, target, and screen</b>	Identify Award recipient candidates from around the globe	<ul style="list-style-type: none"> <li>• Conduct in-depth industry research</li> <li>• Identify emerging sectors</li> <li>• Scan multiple geographies</li> </ul>	Pipeline of candidates who potentially meet all best-practice criteria
2 <b>Perform 360-degree research</b>	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> <li>• Interview thought leaders and industry practitioners</li> <li>• Assess candidates' fit with best-practice criteria</li> <li>• Rank all candidates</li> </ul>	Matrix positioning of all candidates' performance relative to one another
3 <b>Invite thought leadership in best practices</b>	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> <li>• Confirm best-practice criteria</li> <li>• Examine eligibility of all candidates</li> <li>• Identify any information gaps</li> </ul>	Detailed profiles of all ranked candidates
4 <b>Initiate research director review</b>	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> <li>• Brainstorm ranking options</li> <li>• Invite multiple perspectives on candidates' performance</li> <li>• Update candidate profiles</li> </ul>	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 <b>Assemble panel of industry experts</b>	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> <li>• Share findings</li> <li>• Strengthen cases for candidate eligibility</li> <li>• Prioritize candidates</li> </ul>	Refined list of prioritized Award candidates
6 <b>Conduct global industry review</b>	Build consensus on Award candidates' eligibility	<ul style="list-style-type: none"> <li>• Hold global team meeting to review all candidates</li> <li>• Pressure-test fit with criteria</li> <li>• Confirm inclusion of all eligible candidates</li> </ul>	Final list of eligible Award candidates, representing success stories worldwide
7 <b>Perform quality check</b>	Develop official Award consideration materials	<ul style="list-style-type: none"> <li>• Perform final performance benchmarking activities</li> <li>• Write nominations</li> <li>• Perform quality review</li> </ul>	High-quality, accurate, and creative presentation of nominees' successes
8 <b>Reconnect with panel of industry experts</b>	Finalize the selection of the best-practice Award recipient	<ul style="list-style-type: none"> <li>• Review analysis with panel</li> <li>• Build consensus</li> <li>• Select recipient</li> </ul>	Decision on which company performs best against all best-practice criteria
9 <b>Communicate recognition</b>	Inform Award recipient of Award recognition	<ul style="list-style-type: none"> <li>• Present Award to the CEO</li> <li>• Inspire the organization for continued success</li> <li>• Celebrate the recipient's performance</li> </ul>	Announcement of Award and plan for how recipient can use the Award to enhance the brand
10 <b>Take strategic action</b>	Upon licensing, company is able to share Award news with stakeholders and customers	<ul style="list-style-type: none"> <li>• Coordinate media outreach</li> <li>• Design a marketing plan</li> <li>• Assess Award's role in future strategic planning</li> </ul>	Widespread awareness of recipient's Award status among investors, media personnel, and employees



## The Intersection between 360-Degree Research and Best Practices Awards

### Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

### 360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



## About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages more than 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.