Newsletter December 2012

Managing Complexity in Petromaritime Operations

STORD/HAUGESUND UNIVERSITY COLLEGE

PETRO MARITIME RESEARCH TEAM
HSH, HAUGESUND

The Complexity project studies how complexity is handled in petromaritime operations.

We have been looking at complexity challenges in subsea operations, on ship bridges, in the renewal of a gas processing plant, and in shipping companies' efforts to shape and maintain favorable company images. This newsletter gives examples from our research.

The project is now in its fourth year, and will be concluded in April 2013. The funding comes from the Research Council of Norway (80%) and from our business partners Statoil, Gassco, Solstad Offshore, Østensjø Shipping, Eidesvik Offshore and DeepOcean. Twenty researchers are engaged from the following Norwegian institutions: Stord Haugesund University College, the Norwegian School of Economics (NHH), SINTEF, Institute for Energy Technology (IFE) and Polytec. Five researchers from the United Kingdom, the United States, and Austria also participate.

In this newsletter we will give you a touch of the variety our research team is dealing with:

Balancing Structure and Flexibility in a Multiteam System

Excerpts from a presentation at the Academy of Management People and Organizations Conference, Philadelphia September 28-29 2012.

When a vessel arrives at its destination to perform specialized inspection, maintenance or repair (IMR) operations on a part of the subsea infrastructure, it is held stable by Dynamic Positioning (DP) and work is performed with remotely controlled Robots (ROVs). IMR operations involve high-risk work on the Norwegian Continental Shelf. Despite operating in such an extreme and dangerous environment, IMR operations have a strong track record for safety and success. What accounts for this?

In an initial field study that involved a two week trip on an IMR vessel, we discovered that IMR operations are conducted by a multiteam system comprised of five different companies and that involves seven different team and individual roles. For the duration of an operation, this complex organization is placed under the leadership of a Shift Supervisor.

The execution of IMR operations is a highly complex and tightly Coupled process - errors can quickly escalate and lead to potentially catastrophic consequences. We found that the safety and success of the operation is enhanced by a set of planning meetings that take place once the vessel leaves shore, in which procedures are discussed in great detail. As the vessel gets closer to the work site, these meetings involve more of the people who will directly execute the operation.

While we found that the structure provided by these planning meetings was critical to the success of the operations, rules and procedures assume a degree

of predictability. In our research we found that events occurred that were not expected, and not accounted for in the plans and procedures. For a system to operate successfully under these conditions it must be able to respond quickly and flexibly.

We observed that coordinating the complex activities of the multiteam system took most of the Shift Supervisor's attention. However, at times, unexpected events would require him to exercise other leadership functions, which could distract him from his primary, demanding task. One option would be to stop the operation. Instead, others would manage the issue on his behalf, which allowed work to continue. These interventions, while not the person's formal responsibility, were informed by a shared understanding that all on board are responsible for safety. We labeled this additional response capacity leadership redundancy, and hypothesized that this resource may enable this complex organization to respond flexibly to unexpected events.

Following our field study, we did additional data collection to test our understanding of how leadership redundancy operates in IMR operations, and how it is experienced by members of the multiteam system. We created stimulus cases based on interviews with informants and situations we had observed in the field, and conducted interviews with 35 informants across the industry from five different vessels.

In the case interviews, informants confirmed that unanticipated events do occur that, if left unattended, will impede the coordination, if not the safety and success, of the operation. Our data also confirm that Shift Supervisors may, at times, have limited awareness and capacity to respond in a timely manner to these events. He may be so focused on task coordination that, unless he puts the operation on hold, he has little time to pay attention to anything else (e.g., challenges in the next phase of the operation, building or repairing relationships, or coaching). Leadership redundancy, like other forms of redundancy, creates organizational slack, which can increase the ability of the multiteam system to cope with surprising events.

Mindfulness and Mindlessness

Excerpts from a talk by Idar Alfred Johannessen

Organizations may also operate in mindful or mindless ways. An example of mindlessness may be when a strategy is pursued like dogma, unimpressed by new information. An example of mindfulness may be when collectives have learned to pay attention to weak signals of trouble that may be building up and anticipate unexpected events. In organizations, however, mindfulness must be seen in the context of coordination. For example, when subsea operations are executed, people from different companies align under the leadership of a Shift Supervisor. Interdependence is tight and time pressure is high. Procedures tell people what is safe and what to expect from each other. Yet unexpected events do disturb the smooth flow of operations. The ripple effects may render the tightly coupled operations vulnerable to disturbances. But they have a capacity for flexible response that compliments the otherwise rigorous system. Mindfulness in organizations is therefore linked to balancing structure and flexibility. In this talk I will present what the research literature has to say about what it takes for organizations to accomplish this, and what our own research shows.

Consider driving a car. You don't need to stop and think to figure out what a red light means or how to shift gears, and you quickly and automatically hit the breaks if a moose suddenly tries to cross the road. You approach road works and you see a sign for a diversion. The sign leads into an area where there is one clearly visible dirt road, but you also notice other, possible routes. You slow down and stop, trying to make sense of the multiple roads where you had expected to find one detour, clearly marked.

Consider a different example. You are still driving a car. This time, it is late and dark, you are tired and your mind is set on your goal of getting home in time for dinner. You hardly notice that your shoulders are lifted and that you are peering forward, trying not to be blinded by the headlights of approaching cars. You are dimly aware of an annoying sound. You say to yourself that it is probably just a small branch temporarily stuck under the car. Your focus is on getting home, so you drive on, ignoring the sound for now.

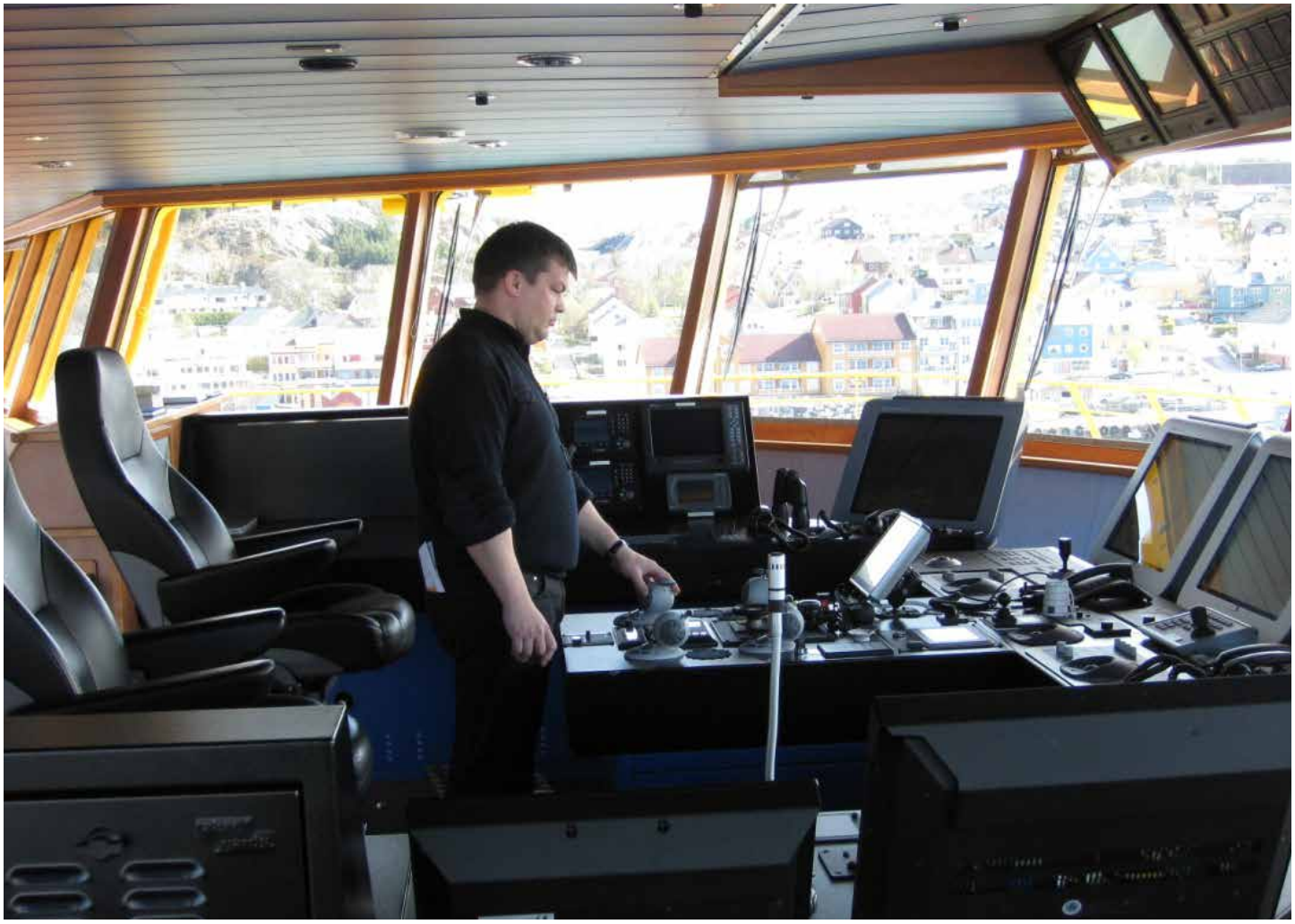
Although both stories may end well, there is difference in the state of mind of the drivers. In the first example, the driver seems to have a relaxed presence in the act of driving, and she can easily mobilize a more keen presence if needed. When facing new information, she does not only attend to the expected (the visible dirt road), but also brings her peripheral vision (the unexpected multiple roads) into awareness. The driver seems to be mindful of what she is facing and what she is thinking and doing.

In the second example, the driver seems to be consumed by his goal in a way that reduces the amount of disturbing information he is capable of relating to. He is attending to his goal more than to the present moment, and he mindlessly presses on, ignoring ambiguous signals that enter his awareness.

It also makes good sense to distinguish between the first driver's reactions 1) to the moose, and 2) to the unexpected lack of clarity about the roads. In the first instance, the driver reflexively (and appropriately) hits the breaks. In the second instance, the driver slows down to consider her options in a reflective manner.

What would it look like if the night driver were in a more mindful state? He might notice his own fatigue and his tense posture, and become aware that he was trying to force himself to stay awake. He would sense his own irritation at an unexpected sound that might disturb the journey, and notice his temptation to drive on in spite of a potential sign of danger. Still under stress, but in a more limber state of mind, he might be able to see impulses in perspective and even reconsider the goal of getting home in time for dinner.

For those who are no longer learners, driving is a skilled (hence automatic) activity. The mindful driver would, however, be more aware of inner impulses, and a wider range of new (and possibly unexpected) pieces of external information. Part of the driving would remain automatic (or skilled). But the awareness would be such that the driver could pause to think and make conscious choices when required. In this state of mind, new information is not pushed aside to simplify matters, but noticed and sometimes brought to the center of attention.



A field study on an offshore vessel

Tone Sydnes

This field study is a part of our research on complexity in maritime operations and in particular on human behavior and interaction. We have focused on ship bridge systems that incorporate equipment for Dynamic Positioning (DP). DP represents an important technological advance and has made possible operations that hardly can be carried out using purely manual maneuvering. On the other hand, DP also generates new challenges, due to the automation aspect of the technology.

Some offshore operations involve long standby periods on DP without active participation from the operators. This can lead to passivity and fatigue, a well known phenomenon in the sector. Periods of mental under-load may reduce the operators' ability to handle demanding situations. Additional demands and challenges for bridge officers come from the organizational structure on board the vessel. In many cases, several companies are represented, and communication lines and decision -making procedures may be unclear.

We report from a field study carried out by the author on board an offshore vessel during an operation on a seabed installation. In this field study, the focus has been on the officers in charge of the DP.

We have documented the officers' experience of the use of the dynamic positioning system and its user interface. While the DP system has many advantages, we discuss how it may unintentionally undermine the officers' practical seamanship, for example their skills in navigation and maneuvering.

The Strategic role of reputation and Identity in recruitment

Chunyan Xie, Richard Bagozzi, and Kjersti Meland

Attracting "the best and the brightest" is vital for companies' survival and development. Our study draws on research on "employer branding" and investigate to what extent a company's reputation and identity impact potential applicants' job-seeking intention. An online survey was conducted among students from Stord/ Haugesund University College with majors in business administration, engineering, and nautical studies.

A key finding is that a company's reputation and identity (image) do matter in its recruitment process. If a company is well-known and has an identity that matches job applicants' identities (values), it will be more attractive to its potential applicants. This is because a positive organizational image is assumed to enhance applicants' self-images. A practical implication is that a firm should build a positive reputation in order to attract and recruit the best talents; moreover, it should try to understand its potential applicants' values and identities and communicate a well defined identity that matches those values.

Communicating what we learn

Findings of our own research are communicated in academic reports and articles. We share what we have learned with colleagues at home and abroad. Also important, we researchers get to know petro-maritime business, and the business side gets acquainted with us. In this process, we harvest material that we can bring back to our students to make our courses more relevant and realistic. We have created lectures and case materials for teaching purposes. More will follow in 2013 to let our students see how common themes in organization studies are addressed in business in our own area.

In 2012 we have offered a menu of presentations for our partner organizations. In 2013, we are planning a seminar with people engaged in subsea operations to present our findings on how those operations are managed.

Published articles

1. **Jordan, S & Jørgensen, L., Mitterhofer, H.:**
   Sensemaking and discourse analyses in inter-organizational research: Current debates and a methodological outline for studying the role of mediating instruments. Published in Scandinavian Journal of Management, June 2012.
2. **Hillestad, T., Xie, C., Haugland, S.:**
   Innovative corporate social responsibility: The founder's role in creating a trustworthy corporate brand through "green" innovation, published in Journal of Product and Brand Management, 2010.
3. **Atoosa Thunem:**
   A Survey of Organization Studies Relevant to Safety and Dependability published in ESREL09, ISBN 978-0-415-55509-8, pp. 755-760, September 7-10, 2009, Prague.
4. **Xie, C., Haugland, S.:**
   The Impact of Business Relationships on Corporate Reputation and Trustworthiness, published in the 40th EMAC proceedings 2011, Ljubljana.
5. **Johannessen, IA., McArthur, P. & Jonassen, JR.:**
   Leadership Redundancy in a Multiteam System. Published in proceedings APMS Sept 2011. ISBN 978-82-7644-461-2.
6. **V. Frette, G. Kleppe, M. Vold, and K. Christensen:**
   Ship maneuvering on simulators: expert evaluations versus quantitative characterization. Published in proceedings of MARSIM 2012, Singapore, no ISBN number.
7. **Xie, C., Bagozzi, R.P., Meland, K.:**
   The impact of reputation and perceived organizational identification on employer brand attractiveness; The 41st EMAC proceedings 2012, Lisbon, ISSN 1027-3395.
8. **Thunem, J. Ferkingstad, V. Frette:**
   A comparison between the nuclear and the maritime domains on challenges related to technological advances. Proceedings of PSAM & ESREL 2012, Helsinki, ISBN 978 162 276 4365, print in process at Curran & Assoc.
9. **T. Sydnes, A. Thunem, and V. Frette:**
   A field study on an offshore service vessel: Alienation and seamanship. Proceedings of PSAM & ESREL 2012, Helsinki, ISBN 978 162 276 4365, print in process at Curran & Assoc.
10. **Johannessen, I.A., McArthur, P. & Jonassen, J.R.:**
    Leadership Redundancy in a Multiteam System; Published in Frick, J. & Timenes Laugen, B. (Eds.): Advances in Production Management Systems, Springer Press Oct. 2012, revised selected papers. IFIP AICT 384. Revised version of article number 5.

Results

10 Published articles

7 Further submitted articles

8 Articles in the pipeline

59 Lectures at conferences and seminars

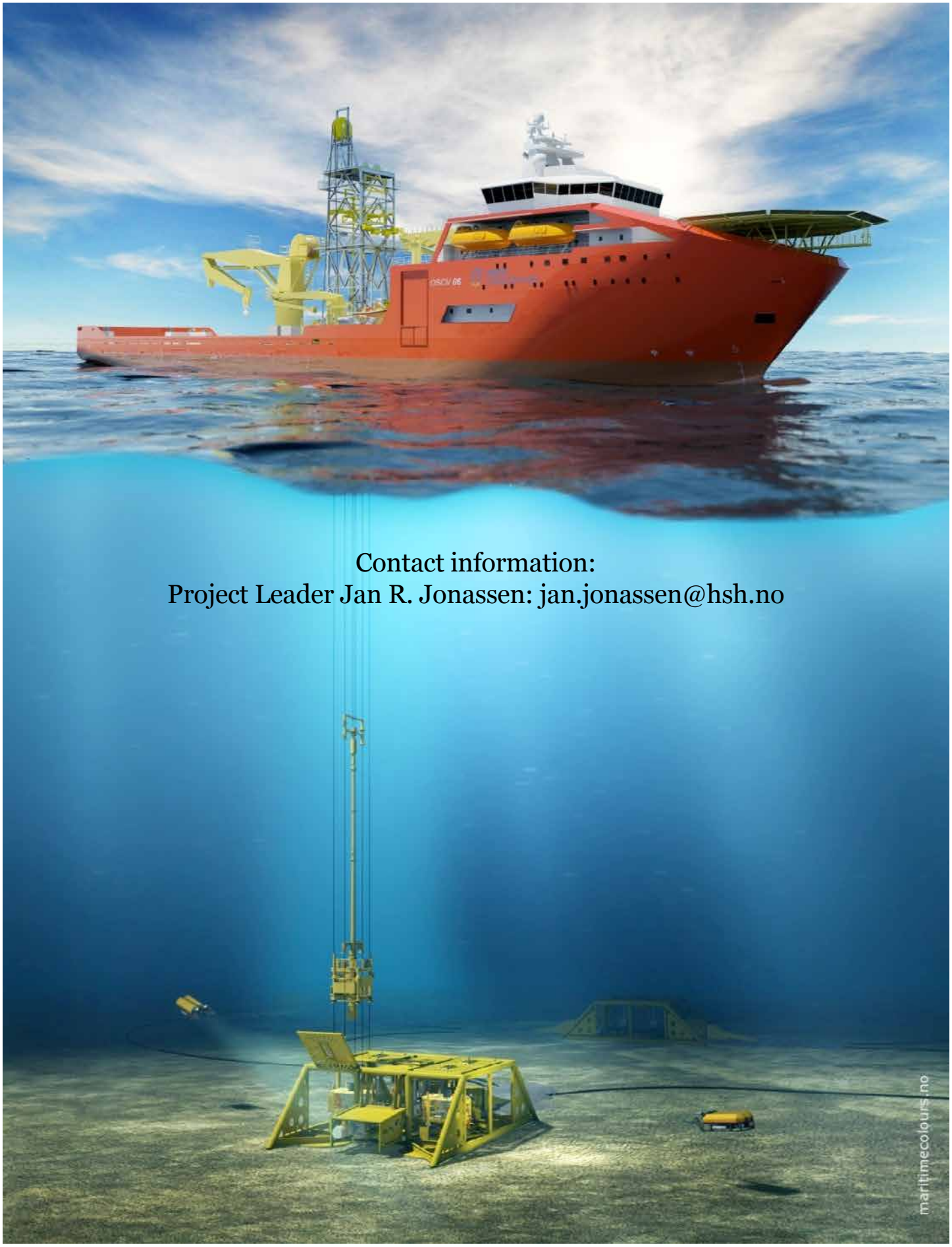
1 PhD candidate to finalize dissertation next year

5 Master theses from University of Bergen

4 Partner seminars

23 Research workshops at Stord/Haugesund University College

5 International professors and researchers engaged throughout project.



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