

EFFECTS OF MULTI-TEAM LEADERSHIP ON COLLABORATION AND INTEGRATION IN SUBSEA OPERATIONS

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Inspection, maintenance, and repair (IMR) operations in the North Sea are performed from specialized vessels. The article contributes to the understanding of leadership as being too complex to be described as the strategies and behaviors of only one person. These leaders work in concert to be facilitating and contributing to flexibility and adaptation thus initiating collaboration between teams and individuals through interaction processes. This unique leadership model allows for and generates openness, transparency and the practice of basic values like respect and helpfulness. The challenge for the leaders in subsea operations, however, is to create or contribute to the creation of an overarching collective identity to facilitate the transformation of the organization from a diversified and more fragmented organization consisting of several individual sub teams to an executive force of one overarching team supervised by one leader. A “sharedness” of mindset is developed through a set of collective communication. With shared mental models, there is a better chance of creating a collective flow of work. Openness and a short distance between leaders and subordinates also affect the ability of the organization to discover mistakes and rectify them earlier than otherwise possible. The challenge is as ever both individual and organizational: The ability to work together towards goal achievement. The paper introduces elements building a foundation for successful leading of complex multi-team operations.

Our story began with an IMR (Inspection, Maintenance, and Repair) vessel reaching its destination at a subsea installation (known as a template) in the North Sea. Once there, it was held stationary using dynamic positioning (DP) technology. Specialists performed the subsea operations using robots, called Remotely Operated Vehicles (ROVs), which were attached to the vessel by umbilical cords. A complex set of teams and individuals moved into action under the coordination of a Shift Supervisor – a multi-team system (Mathieu et al., 2001).

The Shift Supervisor acted as the conductor of the operation and was required to stay in the control room for the duration of his 12-hour shift. He was in constant contact with the bridge, the subsea operations team, the Client Representative on the vessel, and a variety of specialists.

When the ROV pilot closed one of the valves on the template, the Shift Supervisor checked the task plan and directed the pilot on how much pressure to apply. The Shift

Supervisor gave the order to remove a leaking valve cap on the template and bring it to the surface for inspection. The Shift Supervisor had to determine, with input from the third party team (technical expert team, technical company) and the Client Representative (oil company representative onboard), whether it could be fixed onboard or had to be replaced with a new one. During the operation the Shift Supervisor requested a good picture of the other valves from the pilot flying ROV 1. He gave direct orders to the pilot flying ROV 2 over the intercom: "Take care with the valve! Wait! Looks like paint flakes on the coupling; give some power injections of water. That's fine!"

Next the ROV crew had to recover a THISL (lock mechanism on a subsea module) cap from the wellhead to the deck when the wire and ROV hook got stuck. Third party technicians joined the riggers to solve the problem. With tension in the air they all tried to contribute solutions in order to reduce downtime with the module on deck instead of in the sea. The Medic continued the story:

The Deck Foreman was a little frustrated and became stressed. He could see all those balls flying in the air and lots of opinions from the team and couldn't see a way out. He stopped the operation and called for a time out and requested a tool box conversation from the Shift Supervisor. The Senior ROV Supervisor, Offshore Manager, Client Rep and Project Engineer joined them to discuss possible solutions. The tension was not high, but I wondered when listening to them: Do they listen to each other or just prepare for their next argument?" The Medic continued, "When I watched their body language and heard how they responded to what had been said, I thought they all were within themselves. Then the Client Rep calmed the tension by stating that the well was dead and out of current production, so we could use time to find the best solution. It all ended with a common reality agreement and an action plan to go ahead and prevent the situation from reoccurring. (Medic on vessel no. 1).

The Shift Supervisor started focusing on the upcoming operation, a crane operation. This was a so called "nice-weather" operation where they need a minimum of a 12-hour weather window from start to finish. A concrete pipe was on the seabed. The Captain worried that it could have been sucked down in the mud and gotten stuck there. In these cases the vessel had to work the crane wire backwards and forwards to loosen up the pipe. This could take time and be dangerous, so they had to be reasonably sure of the weather window. The weather forecast showed a window opening that was on the borderline of being safe, but the captain was not sure. Some signs in the sky worried him. The wire was already down but was not yet hooked on when the Captain contacted the OM (Offshore Manager) and the Client Rep and ordered a halt in the operation. He told them that when a low pressure cell was coming with the signs indicated just then, it could come really fast like being released from a bag. He pointed to the pearls of water on the window and the cloud formations in the sky. The decision was not a popular one, but it was respected and the wire was pulled up. The Captain is responsible for the safety of vessel, equipment, and crew. The OM informed the Shift Supervisor about the decision. Hell broke loose twenty minutes later with a storm lasting four hours. "If I hadn't been right," the Captain later said in an interview, "there would have been discussions."

This brief snap shot of a day in the life of an IMR operation crew is based on data from interviews and observation collected during a two-week trip onboard an IMR vessel. As this illustrates, IMR operations are complex, with many moving parts that must be tightly orchestrated, and multiple interests and concerns that must be met. Given the high degree of complexity, occurrence of unexpected events, and the stress of operating in an extreme environment such as the Norwegian continental shelf, one might predict that conflict and errors would be frequent. Yet, this is not the case; the frenzy of activity that constitutes an IMR operation typically goes well, which raises two key questions: why and how?

The Captain is in charge of the vessel. He's the number one in charge. I'm [OM] in charge of running the project. But, it's not a shared leadership. We have defined barriers of control. We actually have three leaders from three different companies sitting onboard. We have to do it together every day. How many places onshore do you do that? (OM on vessel no. 5)

This quote epitomizes the research question for this paper. These IMR operations are managed by a set of managers on different levels: strategic, borderline, operational, client control, team, and procedural. Each of these areas or functions is not always taken care of by one, dedicated formal leader.

How is it possible to lead in plural in order to effectively initiate multi-team integration and collaboration?

The five vessels represented in the analysis are all engaged in the same trade, IMR, or the Inspection, Maintenance, and Repair of oil and gas installations on the seabed of the Norwegian continental shelf. They perform the same type of operations over the course of a year, but may differ when it comes to the variation of the tasks. The operations are performed by ROVs, remotely operated vehicles. The vessels are equipped with 2 – 7 such ROVs (working ROVs and/or survey/inspection ROVs). Only two of the vessels clean pipes using scale squeeze operations, while the others do more inspection than maintenance and repair. The organization onboard the vessels are very similar, and the leadership structure is similar, but may vary in the details depending on the type of ongoing operations. The nationality of the crews varies as well as the type of contract from the subsea contractor and the shipping company. The five vessels in our sample were all on long term contracts for 1 - 5 years. Spot contracts are said to be used more frequently on the British side of the North Sea. These two factors, national homogeneity and the type of contract, may have an impact on the execution of leadership even if the organization is the same.

The IMR context is characterized in the following way:

- The priorities and plans are set through a thorough planning and analysis process involving the actual performing parties in order to create structure and predictability.
- The different parties onboard collaborate in order to be successful.
- The teams, here called component teams (Mathieu et al., 2008), are managed by a supervisor. The ROV Supervisor and the Deck Foreman report to the Offshore Manager, the marine teams report to the Captain, and the third party teams' supervisors report and stay in contact with their own headquarters onshore.

- Once the IMR vessel has arrived at the operation's location, the organization changes and the different expert teams are merged into one execution team under the leadership of one supervisor, called the Shift Supervisor.
- The component team remains intact for briefings, coaching, learning, and expert discussions while operations are ongoing and some of the team leaders have the responsibility for reports and borderline activity with the onshore office, for example the Senior ROV Supervisor on technical planning issues and third party supervisors on their running activities.
- The top leaders onboard (the Offshore Manager, Captain, and Client Rep) are not in charge of carrying out the details while the operation is under way, but rather perform various tasks of reporting, borderline contacts, contract issues, and supporting tasks, which may be characterized as redundant leadership (Johannessen, McArthur, & Jonassen, 2012).
- Priorities frequently change due to varying weather conditions and changing priorities between the different production fields offshore. Each licensed field often consists of several oil companies and owning parties, which may at times have conflicting priorities.
- The teams carrying out the operations are exposed to different types of risks, from the risk of gas leaks from the subsea structure to the heavy objects and containers stored on deck in heavy waves.
- The teams also have to deal with unknown elements on the seabed and underwater structures that create challenges to their ability to rearrange, regroup, or rethink earlier solutions.

Need for Research on the Efficacy & Effects of Multiple Leaders & Multi-Team Integration

The data in this study stems from the IMR subsea business on the Norwegian continental shelf and will not be used to characterize leadership and organizational behavior within other areas. This type of leadership model is developed to handle the encounter of humans, technology, rough and changing environments. The oil and gas business in the North Sea and the Norwegian Sea is considerable and a study of the type of leadership and actual behaviors will add value to the understanding of leaders in action performing operations in extreme environments. The paper will discuss the leadership model in the light of several leadership perspectives in order to also contribute to the understanding of leadership in and between organizational units in general.

Interaction between people in the workplace is fundamentally plural. For interaction to take place there must be at least two parties, typically several. It is therefore reasonable to question the equation of leadership as a property of individuals. "This questioning," Jean-Louis Denis et al. (2012) argue, "leads directly to the perennial interrogation about the nature of leadership. Yet, all inquiries within this line of thinking share one common root: that leadership is fundamentally more about participation and collectively creating a sense of direction than it is about control and exercising authority. This assumption and others problematizes the *individuality* of leadership (i.e. Raelin, 2011; Uhl-Bien, 2006), which in turn requires a reconceptualization of what leadership is and, for some, what indeed it should be." However, as

Christopher Mabey and Kevin Morrell (2011) argue, “the individual cannot be written out of the leadership play.” There is a strong interest in the leadership literature in research describing both individual and collective dimensions. Interestingly, in the last decade much of this literature has contained research on different forms of collective leadership in order to explain the increasing complexity of both organizations and their environments.

During the 90s the Leader-Member Exchange (LMX) theory was further developed into the stage the researchers called stage 4. Graen and Uhl-Bien (1995:233) clarifies: “Up to this point, most of the work on LMX has focused on LMX relationships as dyads within work groups and independent dyads. Within complex organizations, however, this is not representative of the nature of leadership situations, which are characterized most often by a leader and multiple members working together in some type of interacting collectivity. In recognition of this, Graen and Scandura (1987) proposed that, rather than independent dyads, LMX should be viewed as systems of interdependent dyadic relationships, or network assemblies (Scandura, 1995).” These relationships were not limited to superior-subordinate relationships, but included relationships among peers, teammates not just within an organization, but also across borders.

Interestingly Graen and Uhl-Bien (1995:235) calls for further research on the processes which come into play when crossing organizational borders: “How does the pattern of relationships affect an employee’s interactions with customers, suppliers, and other organizational stakeholders... Very little empirical investigation has occurred at this level, and questions abound.”

In this article, we will present empirical data which will throw some light on these questions; however, our interest in collective forms of leadership will focus on multiple leaders in interaction, interacting individually and collectively in order to direct component teams and a total team towards optimal collaboration for the performance of planned tasks in a complex production environment. The relationships we describe are not dyadic, but multiple dynamic in the sense that individual units operate in a structured network in order to be unified into one concerted team at the time of execution. Naturally, by focusing on collective forms of leadership we should move our focus from the individualistic concept of leadership to the more dynamic and process oriented concept of leading as a process. This was pointed out to me by research colleague Professor Erik Hollnagel: “In this case it is less a question of leadership than a question of leading a high risk activity with considerably uncertainty built in.” The longitudinal use of certain concepts may sometimes cover our eyes from seeing, understanding and as researchers, labeling the reality in front of us. In the world of subsea operations where people are stuck with each other on board a vessel for the duration of a trip, mostly two weeks, relations between people are developed and challenged. They are both tied up and flexible at the any time. It’s a dynamic environment, because external changes appear regardless of your own opinion. In the same way their work is highly regulated by government and international regulations, business and technical requirements until they are faced with the unknown at seabed and have to change strategy towards flexibility and the use of their tacit knowledge.

This brings us to the understanding of the world of subsea operations as highly dependent and influenced by the context in which the operators work and interact. All interaction must be seen in relation to other interaction within the organization and across borders (Stacey, 2001, Uhl-Bien, 2006). Further research is needed into the area of relations in organizations, as Uhl-Bien (2006) argues: “We know surprisingly little about how relationships form and develop in the workplace. Moreover, investigation into the relational dynamics of leadership as a process of organizing has been severely overlooked in leadership research.”

This environment calls for a type of leading that both takes care of structure and flexibility. The collective element is represented by multiple leaders, but not institutionalized to take collective decisions. The OM (Offshore Manager) is the overall leader of operations, but the Shift Supervisor on delegation manages the ongoing operational activities according to Scope of Work and Procedures. The Captain is the overall decision maker when it comes to security and safety for the total crew and vessel. They may make their decisions based on their own judgment, but more likely they consult each other collectively. The most important collective body is the daily operations meeting, led by the OM, where all department and third party supervisors attend to discuss three subject matters; review of the past 24 hours, overall planning for the next 24 hours and thirdly possible current HSE matters. Their roles are clearly divided in theory, but as we shall see practice will scrutinize the flexibility of the system. We will describe this system as multiple dynamic; multiple leaders leading subsea operations.

Theoretical Perspectives

The organization of the subsea operations is a system of a team of teams, a multiteam system. Mathieu, Marks and Zaccaro (2001) define a multiteam system (MTS) as: “two or more teams that interface directly and interdependently in response to environmental contingencies toward the accomplishment of collective goals. MTS boundaries are defined by virtue of the fact that all teams within the system, while pursuing different proximal goals, share at least one common goal; and in doing so exhibit input, process, and outcome interdependence with at least one other team in the system.” Each of the component teams in the subsea operations have goals connected to their unique expertise and the specific task they are trained and commissioned to execute, but as such they contribute in concert to the objective of the vessel, the total organization.

Mathieu et al. discusses four critical levers for the MTS effectiveness: shared mental models (SMM), leadership, information technology and reward systems. We have found that two of these; shared mental models and leadership are relevant critical levers for the effectiveness of the multiteam system of subsea operations. We regard, however, the process of leading a multiteam system as the foundation for producing effectively towards the organization goals. We will in this article present empirical qualitative data to inform this perspective and how multiple leading is performed and contributes to coordination in challenging and fast changing environments as subsea operations on oil and gas wells on the sea bed.

Denis et al. (2012) calls for greater attention to the dynamics of leader groups, attention to the forming process, disbanding, and interacting with other groups. In order to understand the dynamics of performed leadership we must understand what leaders do and not just what leadership seems to be (Mintzberg, 1979). The author aims to contribute to this understanding in this article.

Also within this literature stream, *producing leadership through interactions*, the authors Uhl-Bien, Marion, and McKelvey (2007) draw upon complexity theory to create a perspective called Complexity Leadership Theory (CLT): “A complexity leadership perspective requires that we distinguish between *leadership* and *leaders*. Complexity Leadership Theory will add a view of leadership as an emergent, interactive dynamic that is productive of adaptive outcomes (which we call leadership, cf. Heifetz 1994). It will consider *leaders* as individuals who act in ways that influence this dynamic and the outcomes. Leadership theory has largely focused on leaders-the actions of individuals. It has not examined the dynamic, complex systems and processes that

comprise *leadership*.” The authors argue that traditional leadership models have disregarded what leadership actually is, *a process*. We think this is important, however, in a multi-team system with several leaders, the focus has to be concentrated towards the process, rather than the leader. So, we prefer the process concept and will describe the process of leading a multi-team system in daily operational activities.

The characteristics of a multi-team system are that the vertical coordination between the compound teams is as important as the vertical in each of the compound team that comprises the system. That requires a high degree of coordination between the leaders as such.

CLT also help us to distinguish leadership from managerial positions or roles connected to a person, rather than as something happening between persons. To address the formal managerial roles they use the term *administrative leadership* that refers to formal actions serving to coordinate and structure organizational activities and the concept *adaptive leadership* when they refer to the type of leadership that occurs in emergent, informal adaptive dynamics.

A third type of leadership is referred to as *enabling leadership*, which is the leadership actions exercised in order to catalyze the condition which an adaptive type of leadership needs in order to thrive and develop.

Denis et al. (2012) point to an important distinction of what the core of plural leadership really is. “Some conceptions of plural leadership extend beyond the idea that leadership can be shared between specific individuals to encompass possible reformulations of the notion of leadership itself as constructed by collective processes and interactions. For example, as synthesized by Fletcher (2004), leadership in the plural “(...) re-envision the “who” and “where” of leadership by focusing on the need to distribute the tasks and responsibilities of leadership up, down, and across the hierarchy. It re-envision the “what” of leadership by articulating leadership as a social process that occurs in and through human interactions, and it articulates the “how” of leadership by focusing on the more mutual, less hierarchical practices and skills needed to engage collaborative learning.”

The comprehensive examining of the literature that Denis et al. (2012) did, revealed a diversity of labels used to describe these forms of leadership such as “shared,” “distributed,” “collective,” “collaborative,” “integrative,” “relational,” and “post-heroic.” The notions are not always used consistently and this practice does not help further research in finding constructive descriptions. It tends to be one more new concept for each author. The author has found the leadership of subsea operations to be so multi-faceted that only one of these conceptions would describe the reality too narrowly. As in Mathieu et al. (2001), we use the term multi-team leadership, or as we will express it multi-team leading in order to describe the phenomenon.

Research Design and Methodology

Starting with the broad question about how complexity is managed in petromaritime operations, the research team chose to study IMR operations for three reasons: 1) they are highly complex in terms of technology, leadership, and organization; 2) they have consistently performed potentially dangerous work without major accidents (which is indicative of longitudinal success when safety is the prime communicated goal); and 3) they are configured similarly across the industry, which makes comparisons possible between our initial research and future research.

The researchers have examined the processes of leading and collaborating onboard five subsea vessels. The number of vessels was accidental as this was the number of vessels available

for study within the North Sea area being operated by our industry partners in the project within the relevant time period. The number of cases seems to fall within a practical and ideal range of cases to be reliably and effectively studied within a qualitative study (Eisenhardt, 1989; Baratt et al., 2011). The process of data collection has been highly iterative starting with two weeks of field work observation and 19 interviews, followed by analyses and a reformulation of a wide research question on the study of complexity in petromaritime operations to how leadership is performed to contribute towards and initiate collaboration and integration. To that end, the team of three researchers planned and carried out data collection using interviews; case presentation interviews, and in-depth semi-structured interviews, observations, and focus group discussion meetings onboard the five vessels.

The focus group session resembles what Joe Raelin termed an inquiry group where the observed participants become inquirers of their own behavior and activity (Raelin, 2011:202). The actors are being presented to situations or questions emanating from the observation of the operations as a starting point for discussion and evaluation. The method brings in valuable insight into the dialogic interaction and is in return an observational arena for the researchers.

We wanted to understand how the thinking and behavior of the onsite leaders contributed to a possible explanation. That is why we chose to use qualitative data and as Mintzberg (1979) argues, “We uncover all kinds of relationships in our hard data, but it is only through the use of the soft data that we are able to explain them (p. 587).” And as Raelin (2011:206) points out: “A focus on social practices rather than on individual abilities require an alternative methodology from our preoccupation with detached empirical inquiry. Although we might from time to time “look in” on practices as they are occurring, we need to let the practitioners and the practices speak for themselves. This would require an ethnographic methodology that entails thick description at the expense of parsimonious third-person generalization.”

The present study is thus based on the following collection of data:

- Study of context, documentation and procedures.
- Two fieldtrips in 2009 and 2011, observation and interviews (88, 12 of them at onshore offices), observed meetings (24) and one focus/inquiry group meeting at each of five vessels during 2011.
- The data represents three shipping companies, two subsea contractor companies, two third party companies, and two oil companies.
- The quotes appearing in this paper originating from Norwegian respondents are translated into English. Interviews were transcribed and included in a database, together with the field log.

The statements used in the following analysis represent the two researchers’ common impressions and notes, based on a consensus from the discussions at the focus/inquiry group meetings on each statement. The results give us an indication of how the leadership systems are characterized by the managers onboard the five IMR vessels. We used the analysis to focus our discussion into themes that could be useful when discussing leadership perspectives and practices in operative organizations.

The researchers interviewed 30 leaders in positions relevant to the operations (OM, Offshore Manager; CA, Captain; CR, Client Representative; SS, Shift Supervisor; RO, Senior ROV Supervisor; PE, Project Engineer; DF, Deck Foreman; and ME, Medic) onboard five vessels during a period of six months in 2011 when the vessels were due in port for different reasons (weather, mobilizations, etc.). In this article, the author focuses on the data from the

following questions. “*How do you contribute to collaboration and integration within and between teams?*” “*How do you contribute to people learning from each other?*” “*How do you measure the result of an operation?*”

These questions were developed from the observation and interview data collected during the initial fieldwork to test an assumption that a dynamic collaboration and collective learning process is essential for the efficacy of these operations.

The content of each interview was sorted according to what, how, and when, in order to identify strategies, behaviors, and time (Fletcher, 2004). In the next step, the strategies and behaviors were sorted into categories that were identical or similar in meaning, but expressed synonymously. These categories were then compared with the categories from recent literature, mainly Yukl’s taxonomy (2012). The weakness with our data is the lack of data from team members to gain insight from their perspectives on how the leaders and the whole team work together to build collaboration. The research team has, however, collected observation data from the total setting onboard one of the vessels.

Results

The data reveal that the multiple subsea leaders contribute to collaboration and integration and thereby effective operations by building a foundation for such collaboration.

The Foundations of Leading Multi-Teams Evaluated

The participants displayed an engagement and active reflection talking about the strengths and weaknesses of their collective type of leadership model. There seemed to be significant agreement between the participants and between vessels in their evaluation of the type of leading executed onboard the IMR vessels and a consensus about the strengths of IMR leading as currently practiced.

All five vessels have encountered conflicts among the leaders onboard, and four have seen dysfunctions.

In general the weakness in having many leaders is many “cooks,” mess, and conflicts. This applies to this vessel as well. We get our daily quota of conflicts between the OM and Client, between the OM and the Captain, and conflicts and confusion on who is deciding what the Shift Supervisor is supposed to be doing in some cases. The Client Rep is rushing in to give a message to the Shift Supervisor about what he should do or the third party is coming in to warn about things that may arise. You have these situations in spite of clear lines and that everyone knows the system. (Project Engineer on vessel no. 2)

Two main problem areas stand out here: *unclear lines of communication and responsibilities* and *the impact of strong personalities*. Both of these represent factors that can make or break collaboration and integration. To understand this we have to examine the relationship between leaders and leading as a process. Uhl-Bien, Marion, and McKelvey (2007) describe the Complexity Leadership Theory requiring a distinction between leaders and leadership. They highlight the process of leadership where the dynamic, complex systems and processes comprise leadership. The authors address the formal managerial roles serving to coordinate and structure organizational activities as *administrative leadership* and *adaptive*

leadership to describe leadership in informal adaptive dynamics. The third type of leadership processes is referred to as *enabling leadership*, working “to catalyze the conditions in which adaptive leadership can thrive” (Uhl-Bien et al., 2007).

We support that distinction; it seems in accordance with our empirical data for subsea operations. This also falls in line with our view to regard leading as a process (Hunt, 1999). Uhl-Bien et al. further distinguish the concept: “Management development involves the application of proven solutions to known problems, whereas leadership development refers to situations in which groups need to learn their way out of problems that could not have been predicted” (Uhl-Bien et al., 2007). This illustrates the process when a Shift Supervisor is managing the operation through the detailed written procedure for hours. The procedure is generated on the basis of previous knowledge of the task area, the technology and the conditions at seabed. The process of leading arises when the unexpected suddenly kicks in and requires a different perspective and knowledge outside the realm of the procedure. The organization shifts to a problem solving mode and the whole team of operators, engineers and deck hands from three or four different component team from different companies becomes a leaderful process quite different from the traditional hierarchic model (Raelin, 2011). The migration of authority to the team and team members or real experts (Weick & Sutcliffe, 2007), may create a basis for that transition.

A system with several leaders, some (especially the Shift Supervisor) being tied very much to the management of ongoing tasks when operations are in effect, will create an arena for the top leaders in more flexible roles as they are available and open for being approached. Johannessen, McArthur, and Jonassen (2012) labeled the phenomenon as leadership redundancy when leadership functions, not just formal leaders, enter a role of informally supplementing middle managers due to their tight task performance.

Uncertainties in exercising administrative leadership due to unclear roles and responsibilities may be helped by enabling leadership in entanglement, as redundant leadership may function.

This process of entanglement could also be broken by serious power-related conflicts as the researchers have observed. The Captain is responsible for the safety of vessel and crew, and the Offshore Manager is responsible for the operation, for which the client is paying. So, even when the overall objective for everyone is safety first, difficult situations arise where methods of measuring wave heights and other factors may create an area of different interpretation and conflict.

Major conflicts on contractual interpretations, differences between operational and maritime rules and regulations, and principal differences may often be sent ashore when agreement is not reached onboard. Offshore people are practical (as clearly seen in the observation period) and devoted to their tasks and the performance of the operations. There is less patience with principal formulations, regulative interpretations, and red tape. These cases are often sent ashore for principal clarification.

The subsea leaders refer to different personalities as the most important explanation for conflicts between them. This could be true or it could just be a rationalization to individualize and minimize system dysfunctions. At any rate, research on emotional intelligence over the last twenty years identified the importance of human relationships on the ability to recognize and regulate one’s own and others’ emotions, and empathy for the feelings of others, which is essential for the ability of individuals to influence and motivate others (Goleman, 1995; Mayer & Salovey, 1995).

These were the dysfunctions extracted from the leader's own evaluations of the multi-team leadership practiced onboard the subsea fleet. However, as indicated in the opening of this paper, as complex as this world may be, in general the daily operations are run free of serious problems and dysfunctions. Consider the research question: ***How is it possible to lead in plural in order to effectively initiate multi-team integration and collaboration?*** The leaders' own evaluation focus on three foundations created by this type of leadership: *Openness, the practice of basic values (respect, tolerance), and collaboration (team culture).*

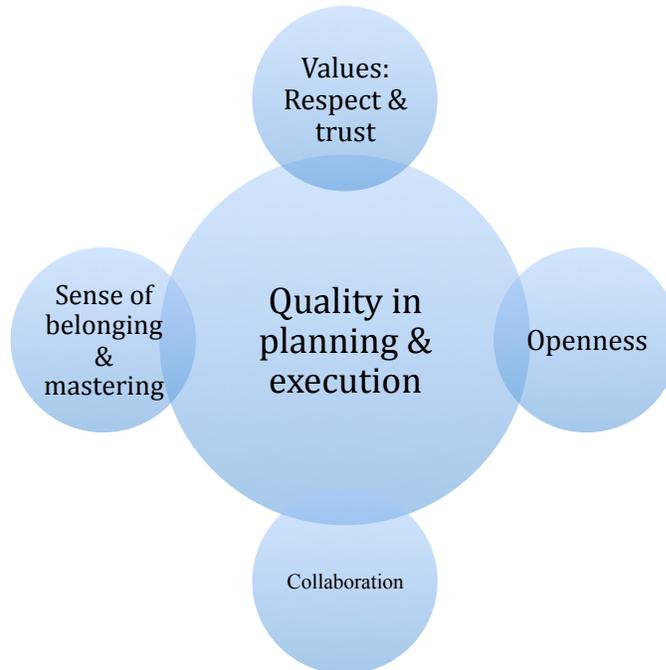
Openness is the most frequently mentioned characteristic and was discussed at all the meetings onboard all the vessels. Descriptions cover these formulations; *flat structures, no barriers between the crew and management, active involvement, reciprocal confidence in each other, high ceilings, well-functioning flows of communication, humility among people onboard, and the last dimension of openness is that people listen to each other.*

It's all about communication, as we discussed. I think we've got strong team leadership onboard, not just from the hierarchy but also with the individual teams, like the ROV teams, the inspection team, and the deck team. There's strong leadership there. The communication is good. But it could be better. We can improve on everything. We always try to improve. I think communication to the shop floor is good. It comes up. The guys aren't scared to speak. (OM on vessel no. 5)

I think it is very important that we have a reasonable flat model here with open dialog. It gives all sorts of possibilities for giving input and ownership to the operation we are to perform. Each individual is becoming more responsible and we feel a part of the whole thing. (ROV supervisor on vessel no. 3)

The quotes above express a feeling of belonging brought about by the openness onboard, which may contribute to the process of creating a shared mental model for the execution of the operations. The quote below comments on the consequences of openness and communication including good planning and the execution of tasks. This may also refer to the result of a shared mental model. As one of the project engineers said, *"When we all have a common understanding and things are going according to plan, things tend to go very well"* (Project Engineer on vessel no. 1). An informant on a different vessel stated,

With openness and communication comes good planning, because people are allowed to express their opinion if they think something is right or wrong. If we didn't have openness and communication, people would not express their opinion and there would no longer be good planning. (Shift Supervisor on vessel no. 4)



The figure above shows the *Foundations of leading Multi-Teams*. Our research indicates certain qualities such as values (respect, trust and tolerance), openness, collaboration and a sense of belonging and mastering; a kind of “we can” feeling generates quality in planning and execution.

Openness and a short distance from the shop floor to the top leadership levels also affect the ability of the organization to discover mistakes and rectify them earlier than otherwise possible. Several of the participants claimed that there was a clear consequence of openness. When the crew is able to report mistakes without reprisals or negative comments, the reports will increase and the mistakes will be rectified in order to stop escalation. One of the Client Reps (Client Rep on vessel no. 4) remarked, “As a client I feel less of a spy with open communication.” “Yes, as long as we have nothing to hide,” the senior surveyor (Senior Surveyor on vessel no. 4) said. “We have transparency, that’s actually a side effect of this kind of leadership -- transparency” (Captain on vessel no. 4).

When asked to identify the strengths of the subsea leadership model, the onboard leaders individually prioritized a characteristic labeled *environment of cooperation, consisting of the following statements: good environment, good info flow and sharing of experiences, good spirit and motivation, and togetherness*. All of these qualities can easily be seen to connect to each other and to create a collaboration and alignment towards solving the team’s tasks. All but one of the focus meetings pinpointed these values as strengths of the leadership model. “We have respect for each other’s job onboard. It’s the same kind of respect between the departments onboard,” according to a Shift Supervisor (on vessel no. 1).

Clear lines of command and responsibility are reported as strength by the leaders of four of the five vessels and were discussed in three focus group meetings. Statements included *the organization (the division of labor between mariners and operatives) are clear and effective*. One Client Rep onboard a vessel stated (Client Rep on vessel no. 1):

The clear division between the maritime running of the vessel and the operation when nothing special is happening, and how the maritime leadership takes command in critical

situations putting all other managers aside, is quite special for the IMR fleet. It gives us clarity of roles as a basis for work.

When lines of command and responsibilities are unclear we have seen this to be the most frequently reported cause of conflict onboard. Combined with opposite personalities this could be an effective showstopper of the operations.

The role as the Client Representative onboard seems to be unclear and challenging for both the actor and the rest of the MTS leadership roles. This is a supervisory and overseeing role without any personnel to supervise. The role is supervisory and overseeing towards the performance of the operations on behalf of the Client. Some clients contract the representatives from consultant companies, creating an even further challenge for the Reps in building trust towards the leaders and crew. Trust between the parties is on trial every day in high performing operations going on around the clock. Communication is key. Information easily slips in the process of keeping all relevant parties informed. As one of the CRs said (Client Rep on board vessel no. 1):

We have an overseeing role with a responsibility to stop any operation; however, we cannot shadow leaders and crew twenty-four hours. We have to trust their inner judgment and balance the oversee role towards the intervening role. In that setting it's crucial for us to know what is happening and I'm a bit annoyed when things happen and I'm not informed.

The IMR work is done according to strict and detailed task plans derived through a thorough process involving meetings and planning activities onshore for months and a continuation onboard ending with the action-oriented toolbox conversation prior to the job execution. This procedure creates the necessary confidence for the parties to work together to accomplish the task. Once down on the seabed, surprises may be uncovered and concerted action has to be taken. The ability of the leaders to utilize a varied competence in the crew and organizing their human resources into collaborative problem-solving teams is a mechanism for coping with unknown realities as described by the informant below (Medic on vessel no. 5):

It's nice when you've got a problem and you come up with a solution, whatever it is. But the big thing is that the encouragement is there from everyone onboard. If you come up with something, it's a bonus. And it's that encouragement that helps everybody else along the line. So, you're not afraid to bring your ideas forward. Okay, it might not work, but at least you're giving it a try. I'll look for another solution if it doesn't work. That helps everybody, whether it's a pilot or a tech, all the way to OM and CR. It makes a difference.

The model allows for or generates openness and transparency, which is seen as a good quality towards the running of the operations. However, this brings in the dilemma of keeping a balance between involvement and interference. The data show that personal qualities seem to be an important trigger for leaders to either keep a balance for the best of the collective or for oneself or for the interpreted good of the owner of the assignment (the oil company or license organization). As one of the OMs (OM on vessel no. 1) said: “*The total competence stays within the team,*” and not individual positions, and “*they know when mistakes are made and what they*

did, they don't like leaders to interfere, which would only lead to less focus on doing a better job."

These are the situations when leading becomes *adaptive* and *enabling* (Uhl-Bien et al., 2007). It's a type of leading that allows people to utilize their total competence working as a team. The leader act as a catalyst for competence, motivation and innovation in the team by reassuring team members of his recognition of their competence and ability to solve the problems. At the same time as stepping aside, showing interest but not interference and steering. This is a parallel to findings in a recent metastudy by Ulhøi and Müller (2014) on shared leadership that managers performing a coaching role help collectives to keep a shared sense of direction.

The multi-team leader acts as a boundary controller both in the sense that he is linking teams to other teams and the multi-team system (MTS) to its broader environment (Mathieu et al 2001). As being responsible for the scope of work according to contract, the Offshore Manager (OM) is monitoring that work is proceeding accordingly. The OM was observed almost frantically in such a boundary discussion with the Client Representative (CR) at one of the vessels as the CR was trying to convince the Shift Supervisor to accept a widening of the team's responsibility. The OM told the researcher afterwards that such a clarification absolutely was necessary in order for the team to be clear on their responsibilities towards the customer. If the Shift Supervisor in order to please the client accepted an expansion of the scope, this would imply an expansion of the contract without a clarification of finance and legal responsibility. What if something went wrong?

A major leadership requirement of the MTS argues Mathieu et al (2001) is the coordination between activities and teams within the system. Within the IMR operations this coordination is performed in several ways. A daily management meeting with all leaders of sub teams, the Captain and the Client Rep, led by the OM is the prime tool for coordination. As earlier mentioned, three foci are discussed: Status for the previous twenty-four hours, what is planned for the next twenty-four hours and all HSE related issues (i.e. stop cards indicating worries from individual crew member or teams). The Shift Supervisor leading the operation according to a detailed task plan performs coordination in detail. He is the pivot of all operations and makes sure resources meets competence at the right time. The Captain coordinates the marine teams running the vessel as a smooth tool for the operations. Finally, the OM performs informal leadership redundancy (Johannessen, McArthur, & Jonassen, 2014). He is walking around keeping an eye to where his help may be needed; small talking, giving advice, connecting actors and teams to release competence and knowledge. This type of leading activity encompass to a large extent what Mathieu et al (2001) describes as a three step model for producing regulated coordination patterns within the MTS: Facilitate contributions from teams and members, provide training and development, and facilitate the development of mechanisms regulating these patterns.

Both individual and collective evaluations of strengths at focus meetings focused on *"environment of cooperation," task performance, basic values, and a flat organization.* "Environment of cooperation" is characterized onboard three of the five vessels by *team feelings, a good tone amongst people, a good climate, motivation and encouragement from management, team work, cooperation, and collaboration.*

One of the Shift Supervisors defined environment of cooperation in this way. *"The strength onboard is the togetherness, which I think is very good here. We have been here since way back, we know each other. There is a fine attitude onboard with good communication*

between people. We don't yell at each other, we use a nice and humble tone" (Shift Supervisor on vessel no. 1). Behind this attitude is an awareness of the effect of basic values such as *equality as colleagues, freedom with responsibility, tolerance, willingness, and giving and taking*

Leadership Behaviors Initiating Multi-Team Integration and Collaboration

The need for integration and collaboration between units and leaders in organizations is greater when major sub-units are highly interdependent with regards to their function or objectives (Yukl, 2008). The teams in subsea maintenance are independent component teams (Mathieu et al., 2001) having different functions, but they all are dependent on each other in order to perform their mission. Integration and collaboration between the teams is one of the most important drivers for success of the operations (found both in the interviews and during observations). Gary Yukl presented a comprehensive hierarchical taxonomy of 15 leadership behaviors in his article "Effective Leadership Behavior" (2012). This taxonomy identifies four categories developed over several years and adjusted according to new research in the area: task oriented, relational oriented, change oriented, and externally oriented. The data in this study support these categories and the identified behaviors are relevant as strategies and behaviors in subsea operations. In addition, our research has identified three additional relational-oriented behaviors that are an integral part of leadership effectiveness in this context: *building relational intergroup identity, sensemaking and organizing*.

Building intergroup relational identity and shared mental models.

"Intergroup collaboration, and hence intergroup leadership, is very much an issue of identity. Group and organizational memberships are an important source of social identity; they invite cognitive-evaluative representation of the self in terms of and membership in the group or organization," argue Hogg et al. (2012). The phenomenon is called "shared cognition" by Pearce and Conger (2003: 12) and refers primarily to the extent that team members share the same mental maps regarding important influences or foundations for their teamwork. The effectiveness of intergroup leadership is impacted by the actual collaboration between groups within the organization (Richter, West, van Dick, & Lawson, 2006). Following both Richter et al. and Hogg et al., we see intergroup performance as "the collaborative performance of two or more formal organizational groups (or organizations) on tasks that require the concerted efforts of both/all groups." The challenge for leaders in subsea operations is to create or contribute to the creation of an overarching collective identity to facilitate the transformation of the organization from a diversified and more fragmented organization consisting of four or five individual component teams to an executive force of one major team supervised by one leader. Each of the leaders has their identity towards their original component team, but in the execution phase they belong to the overall team and are supposed to build on the collective identity without rejecting their component identity. The researcher observed one common phenomenon to support that collective identity building. Onboard the Norwegian-crewed vessels the crews are eager to tell outsiders about their own excellence compared to foreign-crewed operations.

Subsea operation leaders promote intergroup relational identity by supporting third party teams, avoiding entering middle managers' areas of responsibility, utilizing flexibility, integrating everyone in the team, integrating component teams that may fall on the sideline (i.e., the deck team), and by composing teams.

One of the Client Reps expressed that (Client Rep on vessel no. 1):

They must be confident in you and you have to be confident in them, ok? You cannot start when operation starts, so the important thing is to start building confidence in the different departments in advance so they can build respect and confidence, not the least confidence in you.

The migration of identity from compound team to collective action team is an important process for the subsea model to function effectively. Leaders have to contribute to building the common identity while allowing the maintenance of the identity of the compound teams. The researcher observed people gathering around their “compound” tables during meals in relaxed conversation with their compound team mates just prior to joining the collective team in order to continue or start their work back to back with team mates from other compound teams. “An intergroup relational identity, revolves around the collaborative relationship, does not imply intergroup similarity, and allows groups to maintain their distinctiveness,” argued Hogg et al. (2012).

This intergroup relational identity may be helped by the creation of shared mental models created to support basic values of integration and collaboration. Shared mental models (SMMs) are described by Mathieu et al. (2005, p. 38) as “an organized understanding or mental representation of knowledge that is shared by team members.” Marks, Zaccaro, and Mathieu (2000) found the role that team interaction training and leader briefings had on the development of an SMM construct and found positive relationships. Mathieu et al. (2009) refer to another recent development within the SMM literature, which is the consideration of whether it is the “sharedness” of mental models that is most critical to team performance, as compared to the accuracy or quality of the underlying mental models (e.g., Lim & Klein, 2006). This “sharedness” of mindset is developed through a set of collective communication from the first familiarization meeting while on transit to location, continuing on to SJA (Safe Job Analysis) meetings, the daily management operation meeting, informal communication by the leaders, and to the last toolbox conversation prior to the operation. As one of the Offshore Managers said:

The reason why it is generally going well in the operations onboard is, I think, because we have a seemingly detailed familiarization process where we include everyone, whether they are supervisors or not, so they all know what is going to happen. The most important preventative measure you can do, I think, is to make sure everyone knows what is going to happen. They know not only their tiny bit, but the large picture. (OM on vessel no. 2)

With shared mental models, there is a better chance of creating a collective flow of work. As noted in the observation log: “The Shift Supervisor is talking about work flow and productivity. People must be at their workstations during operations and thinking a couple of steps ahead. They must know the procedures. That is why we arrange the SJA meetings.” The third party experts agree: “That’s really positive onboard here”, the supervisor replies, “It creates confidence, all the others know the same as you do and you are working safer.” These are all elements in order to create flow, they all agreed.

These process steps all contributes to the fourth foundation presented in the model: A sense of mastering, a sense of “we can” feeling. This in turn contributes to the result: *Quality in*

planning and execution. The steps towards creating a structure of predictability by guiding people on what is going to happen and identifying their role in the process, depends on the ability of the leaders to convey the message in a sensible way.

Sensemaking

“The challenge for leaders,” Kempster et al. (2013) argue, “is to manage meaning in a way that individuals orient themselves to the achievement of desirable ends.” Sensemaking is thus important as a method of explaining and picturing the purpose of the organization. Sensemaking is understood as a process in which individuals or groups attempt to interpret new and ambiguous situations (Weick, 1995). Stigliani and Ravasi (2012) refer to a definition of collective sense-making from Weick, Sutcliffe, and Obstfeld (2005): “Collective sense-making occurs as individuals exchange provisional understandings and try to agree on the consensual interpretations and a course of action.”

Jørgensen et al. (2012) exemplify how diverse actors in inter-organizational settings may “draw upon collectively shared symbolic resources in order to reach a common understanding.” One of the ROV Supervisors explained (ROV Supervisor on vessel no. 2):

They are very clever in posing questions. They do not immediately accept things they think are a bit awkward. We haven't done this like that before, why this way now? If they receive a reasonably good explanation, it's ok, but if no one is able to give that explanation, we have to have a brief.

A broad interpretation of the concept includes behaviors by subsea leaders as they *contribute to safety climate, impose reflections, give advice on cooperation, communicate to create confidence, and implant suggestions so that they feel like the worker's own ideas.*

Understanding of purpose is an important strategy of leaders to facilitate the process of alignment (Jonassen, 1999). In sensemaking leaders may use a set of available artifacts in order to make the understanding of their message clear and internalized. Kempster et al. (2011) argue that purpose is central to leadership and research has illustrated that the presence of purpose can have desirable effects on followers. Through the work of Smircich and Morgan (1982), Kempster et al. recognize that the process of managing meaning seeks to align followers' sensemaking activities in a particular direction. But such alignment needs to resonate with “desirable ends.” One important part of sensemaking for leaders is therefore the turning of their objectives and intentions into followers' own preferences. Compare this to the expressions identified in the interviews, to “implant suggestions that felt like their own.”

The strategy and behavior of clarification have proved to be of help in the collective understanding of the basis for task work. One of the Deck Foremen happily reported to the researcher that one of the best-performed operations lately was when he (the Deck Foreman) used a clarification check in his toolbox conversation, asking all team members what they actually had understood from the briefing. “What have you actually understood?” This must be one of the most productive questions leaders can ask. In leadership collectives it is important to check out how the individual leader interprets the task at hand, how it is planned to be performed, the potential risks involved, the relationship to the contract, and how this is understood and perceived by the operators. Yet few leaders I have observed actually posed this question at the end of a briefing. These questions are, however, frequently discussed offshore

because people often meet during the day in the control room, in the dirty mess or on the bridge. The contractual side of it is, however, often left out, or left to the top leaders who are responsible for borderline management.

Building shared mental models in followers may be a powerful tool for leaders in creating leadership efficacy. We know that emotions are contagious (Goleman, 2002) and can be used to raise followers' efficacy (Hannah et al., 2008). Hannah et al. (2008) "propose that efficacy might become part of a shared mental model, conceptualized as patterns of overlapping knowledge or beliefs across individuals that a given collective holds." This knowledge and these beliefs may be just what the Norwegian subsea fleet has created as a basis for effective leadership and what is described in this article: openness in human interaction, building and promoting a support culture, recognition of intervention from anyone to stop any operation (stop allowance), building structure and prediction through briefs and communication to everyone, empowerment to component team leaders and operators, building collective and intergroup relational identity, a set of leaders supporting the values and strategies for alignment, and finally a capacity for flexible handling of the unknown and unexpected (Weick & Sutcliffe, 2007).

Organizing

Leaders use organizing principles to arrange the units at the work place according to the complexity of the tasks at hand. IMR projects are complex and need a variety of knowledge and skills in order to be performed successfully. This is solved by assigning different tasks to component teams having specialized competence, where each task could only be finalized with a concerted effort from several teams integrated into one action team under one supervising leader. One challenge regarding the interaction within a component team and between them is sharing enough information to effectively perform the tasks optimally or even adequately. Ellis et al. (2003, p. 824) argued that neither functional nor divisional structures could balance this need for information integration and proposed a structure they called a pair-based team structure. Mathieu et al. (2008) stated: "At their core, pair-based team structures motivate members to share expertise and responsibilities, and thereby may allow for the best mix of common and unique information within the team (Ellis et al., 2003, p. 824). In fact, findings from their research suggested that teams that were pair-based experienced significantly more learning than teams that were either functionally or divisionally structured. In an innovative consideration of team structure that included temporal factors, Moon et al. (2004) assessed how changing team structures influences performance.

Especially putting the teams together, getting people who can work well together. We do not want a lot of "opposite poles." Strong personalities in the same team can create problems. It may, however, be a problem as well, having people going together too well. This can generate too much chitchat. So this is a balancing act. (Project Engineer on vessel no. 3)

The ROV teams are each organized in a pair-based structure and composed with cross competence. They seek to combine the basis-preferred competence of an electrician, mechanic, and automation technician, where each pair has different competence, but the total team comprises all competences. In addition, all pilots are trained in piloting the ROVs. In practice, however, one pilot flies the vehicle and the other controls the manipulators (working arms). The

pilots are responsible for the total care, maintenance, and cleaning of the ROV, with one pair of pilots per vehicle. This will utilize their varied competence and, if necessary (due to a lack of special technical competence), they are able to help each other across the pairs. The structure also probably impacts the quality of their preparation and maintenance, because they are also responsible for flying the same vehicle that they maintained and cleaned. This structure will also strengthen the leader's responsibility as facilitator and integrator rather than focusing on exercising control and authority.

Discussion: The Effects of Multi-Team Leadership on Collaboration and Integration

“More than half a century of research provides support for the conclusion that leaders can enhance the performance of a team, work unit, or organization by using a combination of specific task, relations, change, and external behaviors that are relevant for their situation,” Yukl argued (2012), and concludes: “Why the behaviors are important for effective leadership is explained better by theories about the determinants of group and organizational performance than by leadership theories focused on motivating individual followers.” He suggests that more research is needed on the effects of his suggested taxonomy, especially the behaviors and the joint effects of multiple leaders. The author sees this article partly as a contribution towards that end.

The author has described the leadership behaviors that the researchers observed and identified during interview analysis as the prime behaviors contributing to intergroup collaboration and integration in subsea offshore operations. The article has discussed these behaviors with respect to relevant literature and situations recorded during data collection over more than three years. Observed behaviors are different from skills, values, and traits (Yukl 2012), which are derived from interviews where researchers have to trust what is communicated by the objects. Observation gives a verifying opportunity for the researcher. In this article the author has described behaviors and processes both observed and/or reported in interviews combined with discussions in focus/inquiry group meetings.

The data presented, suggest that all of the listed behaviors in Yukl's taxonomy (Yukl 2012) are identified as behaviors used by leaders in subsea operations. However, the study identified three additional behaviors: *building intergroup relational identity*, *sensemaking*, and *organizing*. These types of behaviors represent a toolbar available and regularly used by the multiple leaders of complexity leadership. These behaviors work well on the basis of some common strengths that characterize this type of multiple leadership, being identified by the leaders themselves as *openness*, *safety orientation*, and *values such as respect, trust and helpfulness*. The occurrence of these strengths may be understood as a result of the Norwegian model of labor relations. Labor relations constitute an important part of the Norwegian social model, characterized by strong employers' and workers' organizations and by close cooperation between the government, employers' associations, and the trade unions, as well as by strong co-determination and participation at the company level (Løken & Stokke, 2009). This societal framework is supported by a strong law of labor relations and work environment, regulating both the physical and psychological environment and protecting workers and leaders from being unreasonably dismissed. This creates a more collaborative relationship between subordinates and leaders (Skivenes & Trygstad, 2010; Engelstad et al., 2003). The use of long-term contracts in the subsea trade by Norwegian operators contributes to a framework where openness can develop and flourish.

The leaders of the multi-team IMR organization are producing leadership through interaction processes (Uhl-Bien et al., 2007). A foundation for these processes to function is the practices of openness and basic values of respect, trust and helpfulness as mentioned above. This foundation is evaluated as a result of the leadership model and maintaining a continuous focus on safety. This ongoing focus on safety and collaboration is connected to structural measures as the opportunity for all involved to stop any operation if it is felt to jeopardize safety, and the creation of structure and predictability through safety meetings (SJA) prior to all operations. This is supplemented by the daily management meeting (attended by all leaders in the operation) with a strong safety agenda in addition to the operational agenda, looking at both what has been done and what is going to be done. This structure and the concerted leadership behavior lead to a collaboration and safety focus. In a study of patient safety chains in hospitals, McFadden et al. (2009) suggested that the TFL (transformational leadership) style, contributes to a cultural shift needed for safety initiative implementation to effectively take place. The influence of a charismatic-inspirational leader is a trigger for the value system to be incorporated and permeate throughout the system. Overall, that effect was not found in the operational subsea system studied here. Personal qualities may strengthen a system already in place, but with the ongoing changing shifts where people are operative for two weeks and off duty for four weeks, a system relying on personal qualities will be extremely vulnerable.

We have focused on the behaviors of multiple leaders and the process between them and between leaders and team members. By that approach we also have focused on the relations between units and their suppliers and customers, which is seen as needed in leadership research (Uhl-Bien, 2006). Both suppliers and the customer is a part of the execution organization onboard the subsea operational vessels. Even if the customer formally is present as an overseer of the total operation, their representatives are seen informally as a part of the total leading structure or body.

Clear roles and responsibilities as one of the strengths of the multi-team system is at the same time evaluated by the leaders themselves as one of the weaknesses characterizing the system when such roles and responsibilities are unclear. Under extreme conditions, such as unexpected incidents, weather conditions, etc., these uncertainties may result in conflicts and dysfunctions of the leadership system. People pass over positions in the hierarchy or try to expand their authority (Johannessen et al., 2011). The participants refer to this as a result of diverging and strong personalities. Entering an open process on the clarification of roles and responsibilities may turn this weakness into strength by a psychological contract between the parties. One of the OMs referred to a silent contract with the Client Rep, keeping the Client Rep in his cabin when he felt down and bad tempered. Bad temper is contagious and may arouse conflict. Here, respect for each other and openness is the basic communication and feedback is the tool, which result is an adaptation of the multi-team system into effective working conditions. As one of the OMs expressed it, "*My only job here is to lubricate the system, remind people of the organization structure, and get the taxi meter going. It's a hell of a nice job, really!*" (OM on vessel no. 1).

The leaders in the last batch of interviews (16 during 2011) were asked to identify the criteria for characterizing an operation as a success. None of the vessels used objective criteria to measure the results of operations. This may be possible, most of them realized, but very challenging due to all the related factors to consider: ocean current, wind, closeness to structures (rigs or other operating vessels), accuracy of plan description, etc. They use the most simple indicators of time (longer/shorter than last time) and safety (accidents or not), according to

specifications or more or less according to a feeling of the work as being done well (for example if a well is brought back into production), or even simply by asking, "Is the client looking satisfied, simply smiling?" Accordingly, we have no useful indicators of operation effectiveness, except from the absence of serious accidents. This is an area where new research should be conducted in order to connect research on the results of the operation to research on leadership behavior and organization.

Conclusion

This article has contributed to the description of leadership as being too complex to be described as the strategies and behaviors of only one person. Leadership is the actions and behaviors of several or multiple leaders working in concert in order to fulfill the objectives and the purpose of the organization (Uhl-Bien et al., 2007). The article has described leaders in concert to be enabling and contributing to flexibility and adaptation in order to initiate collaboration between teams and individuals. The multiple-team leadership model contributes to the creation of openness and collaboration between individuals and component teams. Utilizing this framework, the leaders of these subsea operations exert a set of leadership behaviors in concerted action towards a collaborated performance of the operations.

The article has identified four foundations of leading a multi-team system: Practiced values (respect, trust and tolerance), openness, collaboration and a sense of belonging and mastering. As foundations of leading behavior, this facilitates the coordination of teams into one multi-team system leading to quality in planning and execution. A balance is instituted between creating a structure through a clear task plan, the introduction of everyone to that plan and the development of flexibility by organizing supplemental competence.

This multi-team foundation is supplemented by these identified leadership behaviors: Adaptive, enabling (Uhl-Bien et al., 2007), building intergroup relational identity and shared mental models, sensemaking and organizing.

We have contributed to a relational perspective of leadership focusing on the process of leading in a dynamic context yet on the basis of a structured Scope of work/Procedure. The subsea environment is complex and challenging for the actors and units. There is a need for clear procedures to manage normality (ie. when plans and procedures coincide with reality) and a need for flexibility when the unknown or unexpected is "tapping the door." When normality is predominant the component teams unite in one executive team under a more hierarchic management with a goal of fulfilling the objective of the Scope of Work.

The component team leaders meet once a day to review the work and give necessary signals to the rest of the organization. The Offshore Manager leads the operation meeting and the meeting is the prime collective body of leadership during operations. This body can be seen as an element of shared leadership, because most decisions observed are the results of consensus.

An element of shared leadership can also be found in the team processes in two other situations; the managing of the unknown and the leadership redundancy.

The management of the unknown calls for a more flexible organization. The detailed directing from the Shift Supervisor is put on hold until the situation is restored and the problem is solved by a concerted and collaborative effort of all relevant parts of the executive team. This is a situation where leadership is facilitative trying to contribute by bringing out everyone's potential (Pearce & Conger, 2003; Pearce, Conger & Locke, 2007). This also appears as the fifth principle of the HRO's ability to manage the unexpected, as Karl E. Weick and Kathleen M.

Sutcliffe (2007) describes as Deference to Expertise:” High Reliability Organizations (HRO), delegate decisions to the frontline, to the people with the best task competence on the matter, regardless of their rank.”

Leadership redundancy is contributing to the same objective of freeing the actors’ resources towards the work situation (Johannessen, McArthur, & Jonassen, 2012). This is done by informal or formal leaders walking around capturing the temperature of team members, facilitating processes between team members and coaching component team leaders. These tasks are observed being performed by top leaders onboard as well as people without formal leadership position (Medic).

The migration of identity from single compound teams to an integrated collective action team in “the moment of truth” is key to the success of these subsea operations. Effective leading of the multiteam system is the executive tool towards their success.

So, is there a purpose in leadership? “Leadership is crucial for setting and maintaining clear ground rules, building trust, facilitating dialogue, and exploring mutual gains,” argue Ansell and Gash (2007). Vangen and Huxham (2003) argue; “leadership is important for embracing, empowering, and involving stakeholders and then mobilizing them to move collaboration forward.” Leading complex multi-team operations is by all means possible even in extreme environments at sea and subsea. The complexity is met by introducing a comprehensive task structure, a set of leaders and diversified competent teams to implement the structure. The challenge is as ever both individual and organizational: The ability to work together towards goal achievement. The paper has introduced elements building a foundation for successful leading of complex multi-team operations.

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