Informal leadership redundancy: Balancing structure and flexibility in subsea operations (summary poster)

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Striking the balance

We studied operations that perform inspection, maintenance and repair (IMR) on the vast subsea infrastructure in the waters off the coast of Norway. The infrastructure is the World's largest, and connects installations on the continental shelf with pipelines to Norway, Britain, the Netherlands and Germany. The potentially dangerous operations that we studied are performed from high-tech, specialized vessels where specialists from some five companies work together on a typical two-week mission. Operations are performed mostly with remotely controlled robotic vessels (ROVs) while the vessel is locked in place over a site without the use of anchors. A technology called Dynamic Positioning (DP) that uses satellite navigation makes this possible. Operations are performed all year around in a tough environment, and yet, no major accidents have occurred, and serious incidents have always been contained. This observation is in itself a puzzle, since traditional organizational theory suggests that complex systems with a high degree of rapidly moving interdependence ('tight coupling') will, sooner or later, experience breakdowns (so-called 'normal accidents'). Since the IMR operations seemed more robust, we thought that they might belong to a class of exceptional organizations often called HROs, or High Reliability Organizations. Members of such organizations seem able to anticipate upcoming trouble early and to be better equipped to cope when they are hit by unexpected events. When we studied IMR operations, we recognized many of the features from other studies of HROs, such as a willingness to look at mistakes as a source of learning and that formal leaders often yield power and authority to people that are experts in a field that momentarily is most relevant for the safety and success of an operation.

Organizations in this business put great emphasis on procedures and documentation, and the people involved are expected to follow procedural discipline. This emphasis on structure goes some way to make what happens in an operation predictable. Task plans gives the leader of the execution of the operation, the shift supervisor, a map of the upcoming operation. Each experienced player can know what to expect from the others involved. The emphasis on documentation also makes it easier to settle disputes over responsibilities for error and delays between the contractual partners. On the other hand, complex operations offshore are inevitably full of surprises. When arriving at a site, the realities there can be different from the blueprints created in an office on shore. Aligning multiple teams can lead to friction even if all players mean well, and, if anyone turns out to need more follow-up than expected that can be hard to do for a shift supervisor fully engaged in coordinating the teams in the execution phase. Therefore, on the one hand, this is a world full of structural measures to make operations predictable and manageable, and, at the same time, there must be a readiness to cope with unexpected events when they occur. The traditional way of striking this balance with structure and flexibility has been the institution of the 'All Stop'. This is the widespread rule that says that anyone in these systems can call a stop to an operation until a suspicion of danger has been examined and the potential problem has been solved. We did observe that this mechanism was put to use from time to time. However, this is a costly and

somewhat ‘inflexible’ way of being flexible. Our studies led us to discover a different way of including flexibility into the way these operations are run, which we had not seen described earlier. We labelled this mechanism ‘informal leadership redundancy’.

Petromaritime operations are full of examples of redundancies, such as double or even quadruple technical backup systems to secure safe and uninterrupted operations, should one engine or another system fail. From the cockpit of an airplane, we know formal leadership redundancy, as when a co-pilot can step in, should the pilot fall ill. In IMR operations, we noticed a subtle pattern where some individuals with the necessary skill and will, would sometimes step in and take care of business technically within the shift supervisor’s remit that he was too busy to attend to. To understand this, we need to look at the flow of an IMR trip.

Some 70 people may be on board, and they spend time during mobilization and in transit to a site to prepare the operation and to be aligned around the task of executing the upcoming operation. As the vessel approaches a site, and informal change in the organization takes place which resembles what can happen in a military operation or when an Incident Command System is put to use at the site of an accident. All operational resources, regardless of rank or organizational affiliation are put under the temporary command of the operational leader. Other people on board that are not directly needed for the execution of operation tend to recede into the background, as if not to be in the way. The ‘sergeant’ in this case is the shift supervisor. In the very busy execution phase of the operation, he has his hands full with one leadership function, task coordination.

Other leadership functions that may be called upon to fully lead the system of teams can be hard for the shift supervisor to attend to. One example may be an unexpected technical problem that requires time and attention and a different kind of coordination than the shift supervisor can do at the moment. Another may be to address a need for coaching that is hard to find time for in the heat of the battle, or to handle frictions between the teams. We found that occasionally, some of the people outside the operational subsea time would recognize such needs and move in and take care of them in place of the shift supervisor, without explicit delegation. We labelled this ‘informal leadership redundancy’, since the slack that existed in the system with the people momentarily a step away from the execution of the operation was put to good use in a way that added flexibility to the system without necessarily calling an ‘All Stop’.

We tested our findings with many insiders. They recognized the practice, but it was controversial. The risk, as some people we asked pointed out, was that these well-intended initiatives might lead to more complexity and potential disturbances. Those who judged the practice more favorably also underscored that improvisations of this kind had to happen within the framework of procedural discipline. For example, a representative of an oil company who worked to solve a technical problem in the background actually emulated what the shift supervisor would do if he had the time to take care of the problem himself. The representative took care to involve the right people and to make sure all safeguards and permissions were in place, and to inform the shift supervisor about what he had done after the fact.

Our study shows, on the one hand, that efforts to create leaner operations must take into consideration that some of the organizational slack that exists may serve important functions that are not reflected in written procedures. On the other hand, informal types of improvisation may create noise if some of the people involved are not aware of how and when they are used. Both considerations suggest making informal arrangements and practices subject for open discussion in the communities of practice that carry out IMR operations.