

IMPROVING SAFETY THROUGH CHANGES IN WORKPLACE CULTURE: - A STUDY FROM THE OIL AND GAS INDUSTRY IN DENMARK

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ABSTRACT

The Danish offshore industry in the North Sea has a strong tradition of safety and of reducing work-related accidents, and new policies and practices are continuously being developed. A major challenge is to implement new policies into practice. In particular, routines, norms and cultural perceptions may be difficult to alter in the process of implementing new policies. This study aims to explore the implementation process of a new safety programme in a Danish oil company. By drawing on theoretical perspectives of organisational culture, we particularly address how employees perceive the new safety programme and how it corresponds with or is in opposition to existing norms and procedures. The results of the study showed that the implementation of the programme was successful in some areas, but there were also some challenges. The employees perceived the programme as positive, particularly because they felt that it respected their everyday work routines and that their perspectives were being taken into account. However, cultural changes take time and are further complicated by frequent staff transitions. In addition, one disadvantage was that there was a lack of resources to follow up on all the activities introduced through the programme. Moreover, safety representatives indicated that they lacked concrete and systematic tools to promote and improve safety.

Keywords: Accident prevention, offshore, safety culture

1. INTRODUCTION

Work accidents and injuries have serious consequences for victims, for the environment and for society. The societal pressure to prevent accidents and improve safety in the oil and gas industry is strong, and the industry has correspondingly had a strong tradition of safety in the workplace. Major disasters, such as Chernobyl in 1986 and Piper Alpha in 1988, gave reason to focus attention on management systems, procedures, organisational factors and safety culture (Hale & Hovden, 1998). Improvements in safety and accident prevention can be performed on micro levels (individual attitudes and behaviour towards safety practices), meso levels (the structure, culture and practice of local organisations) and macro levels (national and international legislation related to minimising hazards, design improvement and employee protection). Traditional information campaigns rely on the presumed causality between knowledge, attitude and behaviour — the so-called KAB model (Bettinghaus 1986). However, information campaigns have proven inefficient to change individual behaviour, because they fail to acknowledge and address individual preferences, meanings and the social, cultural and political environments that individuals are part of (Chambers 1997). A comprehensive review of implementation research concludes that there is evidence that information dissemination and training alone are ineffective implementation methods (Dyrborg et al. 2013; Fixsen et al. 2005; Lund & Aaro, 2004). There are suggestions that the success of implementing a new policy, practice or idea depends largely on the system and organisational

factors, the contents of the policy, how meaningful it is to the inhabitants of the setting, and whether time and resources allow inhabitants to adapt to it (Fixsen et al. 2005). Over the last decade, a variety of implementation models have been developed to address local environments, organisations, specific groups or smaller settings where behavioural changes are needed. These models commonly acknowledge that unless a community recognises that a change is needed and does not conflict with existing norms, the policy is likely to fail (Petersillia, 1990). The most common approach in the oil and gas industry is the behaviour-based safety (BBS) approach, which focuses on, among other issues, training employees in safety (Tharaldsen, Olsen, & Rundmo, 2008; Tharaldsen, 2011). But also, the oil and gas industry is starting to recognise that training alone is not sufficient to change behaviour and there is a need to develop new approaches that acknowledge the complexity of implementing new safety policies and procedures. In particular, recent studies suggest that meso-level interventions that consider structural and cultural factors are promising to prevent accidents (Lund & Aro 2004, Dyreborg et al. 2013), and new safety policies building on these factors are currently being developed and implemented in the oil and gas industry. The implementation process is rather complex and difficult to follow, due to extensive costs in both resources and time. Documentation is therefore needed of the effects and also the experiences of the implementation processes. The present study aims to explore the implementation of a safety policy that builds on notions that behaviour changes are best achieved by addressing the work organisation as a coherent unit. Until recently, the oil and gas company involved in the present study had primarily used BBS to improve safety. Their safety performance has improved from when the company first started production, but for the last 10 years, the rate of injuries has been stable and not subject to further decrease. The company therefore decided to develop an intervention that focuses on changing the organisational culture, rather than merely being concerned with changing the behaviour of individuals. The intervention was based on the construction of a *new mindset* containing values that emphasised social support and which were gradually implemented taking into account existing values within the organisation.

2. SAFETY CULTURE

Currently, the concept of a safety culture is widely used within safety research and is a promising step towards understanding the social processes that take place at the meso level, for example, when new safety practices are implemented (Antonsen, 2009; Cox & Flin, 1998; Guldenmund, 2000; Hale, 2000; Mearns & Flin, 1999).

Safety culture draws on concepts of organisational culture, which can be approached in different ways. For example, a key perspective is the distinction between functionalist and interpretative approaches (Glendon & Stanton, 2000). According to functionalist approaches, an organisational culture exists as an ideal that organisations should try to achieve. The primary function of an organisational culture is to support management strategies, systems and goals. This approach is thus expert-driven and gives little attention to members' perspectives. The interpretative approach, on the other hand, understands organisational culture as a complex phenomenon that aims to assist members of the organisation in interpreting their collective identities, beliefs and behaviours. Organisational culture is not the property of any one group or individual, but is created by all members of an organisation. The interpretative approach is more likely to be considered a "bottom-up" approach and allows for the existence of subcultures within organisations (Glendon & Stanton, 2000). Several other perspectives of organisational culture can be identified, including the integration perspective, where culture is viewed as the 'glue' of an organisation and a 'compass' that provides direction to its members who share cultural understandings (Alvesson, 2002; Antonsen, 2009; Richter & Koch, 2004), and also including the differentiation perspective, which focuses on the coexistence of subgroups within the organisation and attempts to uncover conflicts and power relationships within organisations. While the integration perspective focuses on consistency, the differentiation perspective focuses on inconsistency between different aspects of the culture of an organisation (e.g. differences between words, action, official values and real-life practices). This inconsistency could be compared with Goffman's concepts of the front stage and back stage of social life (Antonsen, 2009; Goffman, 1959).

Finally, the fragmentation perspective views an organisational culture as a "web of individuals, sporadically and loosely connected by their changing position on a variety issues" (Martin 1992:153). In this perspective, members of an organisation construct their own definition of reality, and there is no predefined cultural script that provides guidance for behaviour (Antonsen, 2009). In summary, organisational culture is more or less shared by and shaped by its members. The organisational culture has a significant impact on how safety is practised in organisations. This is known as safety culture, which is:

"the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to and the style and proficiency of an organisation's health and safety management. Organisations with a positive safety are characterised by communications founded on mutual trust,

by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures” (Advisory Committee on the Safety of Nuclear Installations(Advisory Committee on the Safety of Nuclear Installations (ACSNI), 1993).

This definition acknowledges that culture is shared by and shaped by its members and thus is building upon an approach that calls for member participation in the implementation processes.

The understanding of organisational culture has a significant influence on how the understanding of safety is practised and perceived and thus it affects how safety programmes are designed and implemented. Our approach in this study follows the safety culture definition, which allows us to investigate if and how the implementation of *the new programme* corresponds with, is in conflict with or adapts to existing norms, values and practices. By drawing on theoretical perspectives of organisational culture, we further discuss the notion of organisational culture embedded in *the new programme* and whether this notion has the potential to alter safety culture to help prevent future accidents.

3. METHODS AND DATA

3.1. Setting description

Oil and gas production started in Denmark in 1972. The production is based on 19 oil and gas fields in the Danish sector of the North Sea, with 55 offshore production installations, 10 of which are manned. A total of 10 companies contribute to the Danish production, but only three of the companies serve as operators (DEA, 2012). The oil and gas industry in Denmark is subject to different regulations. On an international level, regulations are in the form of directives from the European Union, while on the national level, regulations are in the form of legislation and executive orders. One of the main pieces of legislation is the Offshore Safety act, which aims to promote high standards of offshore safety and health (DEA 2012). The oil and gas industry has a different organisational structure than onshore organisations. In Denmark, there are three operating companies that carry out exploration and recovery of hydrocarbons. The operating company participating in this study is responsible for day-to-day operations of an offshore installation. However, the operating company does not provide all the staff at the installation; some of the jobs are performed by contracting companies. The operating company provides the core crew, which includes the management of the installation, supervisors and technical employees in the control room, while the rest of the employees come from contracting companies. The number of employees from contracting companies varies and is dependent on activity at the installation. The Danish oil and gas industry is characterised by offshore production, whereas the management, planning and support of the production are established onshore. The onshore organisation is divided into different units, such as support for offshore sites, exploration, production and the Health, Safety and Environmental Department. The main responsibility for the offshore installation belongs to the Offshore Installation Manager (OIM), who also provides an administrative function; the OIM reports to the onshore management. The crew consists of different groups, all of which have a supervisor/foreman. The education of offshore employees ranges from uneducated employees to highly specialised technicians. Most offshore employees work shifts of two weeks offshore and three weeks at home. The production on the installation is a constant, ongoing process, which means that there are employees present for 12-hour day or night shifts year round. Due to the complicated operations and the risk of explosions, the focus is very much on safety. Employees must follow specific procedures at work and are required to conduct a risk assessment before every task. One of the most important elements of the work offshore is the permit to work. The permit-to-work system ensures that the work tasks are conducted safely and that the employees follow procedures and conduct proper risk assessments. Many of the tasks are categorised as high risk and then require a valid permit to work. This means that the employees have to complete a form in which they describe the work, assess the risk and describe how the risk can be avoided or minimised. The permit to work has to be signed by the management at the installation; without it, the employees are not allowed to proceed with the task.

3.2 The new safety programme

The company involved in the study introduced the new safety programme at the beginning of 2011, which consisted of four steps:

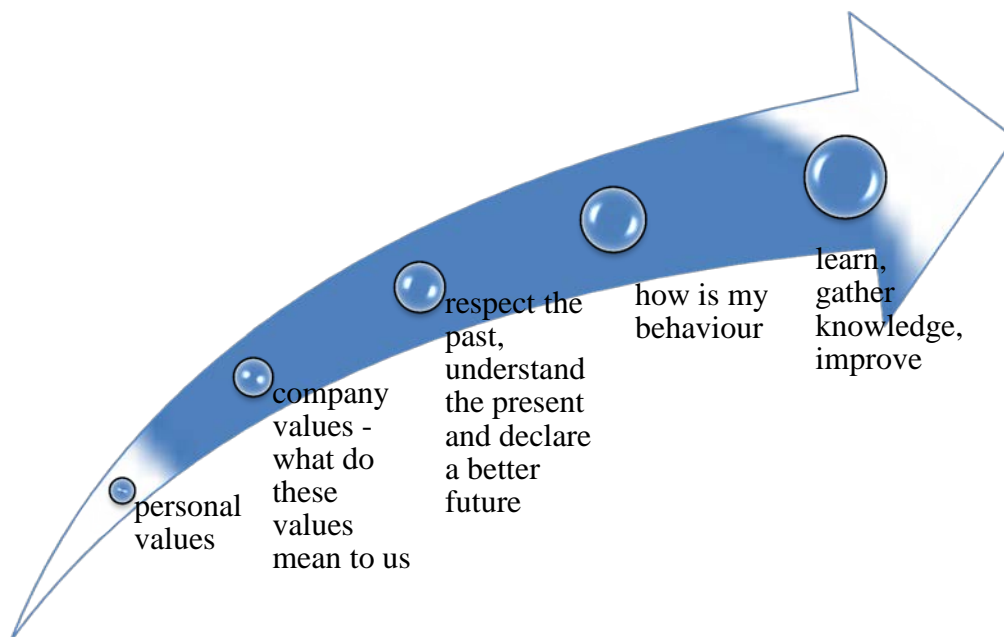
1. Engagement: This took place during the first 6 months of 2011, where 200 employees participated in four Commitment Workshops and 32 participated in “train the trainer” sessions.
2. Motivation: During the last 6 months of 2011, 2300 employees participated in orientation sessions, which lasted one day and in which the employees were introduced to the new programme. 200 supervisors were trained to create dialogue in the company. The goals of the first part of the implementation were to make

the programme visible in the organisation; to motivate the employees and management to share ideas, worries and thoughts; to prevent accidents and to promote safety.

3. Conversion: Activities during 2012 included intense work on implementing the new programme and putting it into practice. The safety performance then improved and every offshore installation had the possibility to choose which activities they would focus on. The intervention on installations consisted of several local activities, including introducing the programme to newcomers, having an increased focus on risk assessment, conducting small internal audits and generally having an increased focus on the new programme.
4. Maintenance: In the period between 2013 and 2016, the improvement and learning from experiences continued. In 2013, the company experienced frequent accidents and decided to refresh the programme with a one-day refresh workshop. All employees who participated in previous workshops were invited to participate in the refresh workshop.

Figure 1 illustrates the company's presentation of the new programme. The figure shows the process, which starts with every employee and their personal values towards safety. The next step of the process is characterised by presenting reflections of existing values and what they mean both to the organisation and to each employee. The next step aims to integrate the past, present and future by respecting previous procedures and building on them to create a better future. This is followed by reflecting on behaviour, including the five points: risk assessment, intervention, acknowledging vulnerability, permit to work and responsibility towards one's own and colleagues' safety. The final step in the programme is about learning, gathering knowledge and improving.

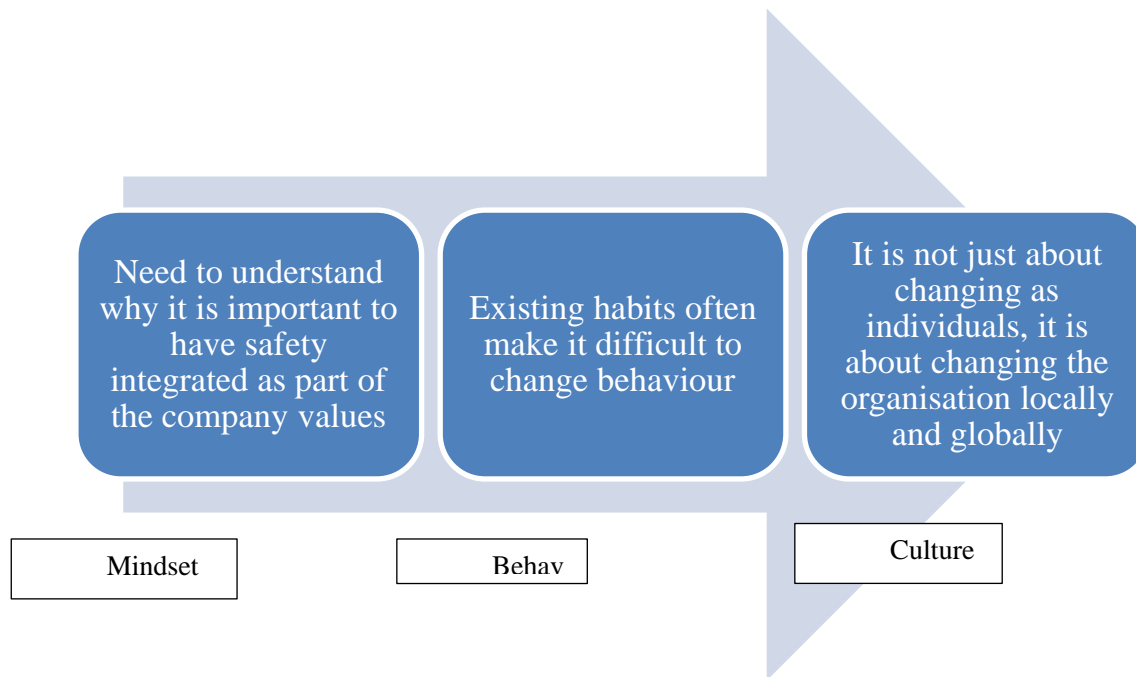
Figure 1: The process of the new safety programme



As illustrated in Figure 2, the overall aim of the programme was to change the existing organisational culture to become a “safety” culture in which:

- the employees take responsibility for themselves and their colleagues, so no one gets hurt
- strong relationships are created between colleagues at the workplace, which are supposed to drive employee safety
- employees can talk freely and discuss and report incidents without fearing the consequences
- follow-up is conducted on good ideas and suggestions
- an attitude that all accidents can be avoided is promoted
- safety behaviour is recognised and rewarded

Figure 2: Development of a safety culture



3.3 Data collection

One operating company in Denmark was included in the study. Data collection took place onshore on the university campus, at the company onshore and one interview was conducted at an airport. The reason for only collecting data onshore was that the present study was a follow-up study with limited time available. The first author has been out on the installations in connection with the previous study and has knowledge and understanding of the work routine on offshore installations (Rasmussen 2013).

The data are drawn from several sources:

- Five interviews lasting from 30 minutes to 1 hour:
 - Three individual interviews with management onshore.
 - Two focus group interviews (2 participants each time) with management level and regular offshore employees.
- Observations of onshore safety meetings (18 meetings).

Observations of two 7-hour workshops about the new programme, introduction to the programme (40 participants) and refresh workshop (40 participants)

- Four 4-hour workshops with offshore employees onshore:
 - In total, 40 offshore employees participated in the workshop at the University. During each workshop, employees were divided into two groups (employees from the same installation were not assigned to the same group if possible).
- Documents: Internal journal that is published 4 times a year from the period 2011-2014; safety programmes from the period 2011-2014.

The first author conducted semi-structured interviews from October to December 2014, based on an interview guide that followed the topics: programme evaluation, communication, attitude toward safety, management's commitment to the programme, procedures, accident prevention and the near-miss system. The interview participants were chosen based on their position in the company, represented different departments both onshore and offshore and were from different levels in the organisations (i.e. management, supervisor). In addition, observations of 18 safety meetings were carried out onshore; representatives from offshore participated by video conference. Observations were made during two workshops organised by the company. Additionally, four workshops were organised by the first author with the aim to explore offshore employees' experiences of the

new programme and their attitudes towards safety, safety culture and procedures. The participants signed up for the workshops voluntarily. One of the challenges of the voluntary format is that some respondents will be very positive and engaged, while others can be critical. The respondents who participated in the workshops came from different departments, representing different job functions and positions at the installation; however, there were few volunteers from contracting companies. All participants were informed of the purpose of the research and were guaranteed anonymity in all written and orally presented materials.

3.4 Analysis

The interviews were recorded, transcribed and coded with NVIVO 11. The observation notes from meetings and workshops and documents such as safety programmes and the Internal journal were also entered into NVIVO 11 (Bazeley & Jackson 2013). The coding strategy was different for coding interviews, workshops and documents. The interviews and data from workshops were coded through open coding. The open coding then underwent a focused coding, in which all categories were read once more and some of the categories were maintained, while others were merged together (Graneheim and Lundman 2004). The document data from the Internal journal and the safety programmes were entered into NVIVO 11 and the initial analysis was based on a word search (the name of the new programme). The word search analysis was used to identify which articles in the Internal journal should be analysed in detail. All articles that mentioned the name of the new programme were read and coded based on open coding similar to that used for the interview transcripts. Afterwards, the coding procedure was identical to the analytical procedure for workshop notes and interview transcripts.

The open coding resulted in 56 coding categories, which were condensed to 7 main categories: visible management, attitude change, open dialogue, personal relationship, common culture, safer working place, ownership. The main categories were further condensed into the following themes: *transparency and visible management, introducing 'soft values' in the organisation, creating a shared culture, and towards a safe future*, which are presented below.

4. RESULTS

4.1 Transparency and visible management

One of the important successes of the implementation of the new programme was the involvement of management. A number of the employees had been working in the company for many years and had tried several different safety campaigns and safety programmes without great success. There was general agreement among the employees that this time it was different and that the new programme was more successful than others. Seen from the employees' point of view, the reason for this success was the involvement of the management and that for the first time they felt that the management team was very serious about safety. As one interviewee said:

"There was commitment from top management, of course we had some external consultants to help, but the biggest thing was commitment from top management. We did workshops, which were conducted by our own employees, and management was involved all the time and present at the workshops explaining that this is important." (Interviewee)

This point of view was also expressed in the evaluation questionnaires distributed by the company and filled out by the employees:

"More than 3000 evaluation forms from those sessions show that what means most for them (employees) was: that they saw their management visible and personally engaged in the new programme." (Internal journal 2012 number 3)

The management realised how important it was to be visible and how much it meant to the employees and their involvement in the new programme:

"It was a big surprise to see how much it meant that I was present when safety was discussed. Support from management has a crucial influence on how big employee engagement is. Management in safety is to show ownership." (Internal journal 2012 number 2)

A former study conducted in the company showed that the company had a functionalist approach towards the organisational culture characterised by a hierarchical management structure with limited space for an open dialogue and employees were reluctant to criticise the company (Rasmussen 2013). Some of the internal surveys conducted by the company each year also illustrated this problem. In the new programme, the company therefore emphasised transparency and building an environment that supported an open dialogue and the possibility for

employees to talk freely about their concerns. The encouragement for an open dialogue was expressed in internal journals and documents with statements like:

“It is all about open and non-judgmental communication and about asking if we are in doubt, every time. And being aware that there are no stupid questions, only bad answers.” (Internal journal 2011 number 3)

The employees also experienced that it had become more accepted to openly talk about worries for colleagues. For example at the refresh workshops, a movie of a gas leak at one of the installations was displayed. The movie showed sequences up to the incident and interviews with employees who were involved in the incident. The employees freely talked about the incident, including their worries and critical perspectives towards the company, which would not have been possible just a few years before.

One of the results of having a transparent environment, which encouraged employees to speak up, was an increased reporting of incidents. Reporting of incidents has been a challenge to the company. Previously, most reporting was about lack of or broken equipment and not about personal behaviour. Especially contractors (employees who are hired by a contracting company) were reluctant to report any incidents (Rasmussen 2013). The picture was quite different after introducing the new programme, which indicated that both the safety awareness and reporting had increased:

“There is reason to be optimistic. For example reporting has increased and some of the reports have changed character. Before the reporting considered only error equipment, now the reporting also contains attitudes and behaviours. And it is happening not due to putting blame on colleagues, but more for learning of experiences. This [new reporting behaviour] expresses a team spirit and an increased will to look after one another.” (Internal journal 2013 number 1)

“The number of reports has increased very strongly during the period. In 2010 we had 500 near-miss reports per year, this year we have 1150 reports already in October.” (Internal journal 2013 number 4)

In total, the company was successful in creating a transparent environment, where the management was visible and engaged in discussions with employees regarding safety issues and where it was encouraged to speak up and be open about one's own and colleagues' behaviour that potentially jeopardised safety at work.

4.2 Introducing ‘soft values’ in the organisation

One of the focus areas within the company, which was introduced with the new programme, was on “soft values.” Soft values refer to the social environment of the workplace, indicating that personal relationships, the well-being of employees and consideration of work conditions are of great importance in establishing a sustainable safety culture. The effect of having better and stronger personal relationships was expected to increase responsibility for preserving own and colleagues' safety, which also meant intervening when someone does not follow the safety procedures:

“In the last year, safety changed to the better after the implementation of the programme. The programme focus means that we are aware of the soft values to a higher degree”. (Interviewee)

“It is like family, where everybody cares for each other. When we get to know each other better, we will get a better – and more safe - working place, because we care for each other.” (Internal journal 2011 number 4)

“It is about the soft values: We have to take care of each other, think safety, remember to step back and think the situation through one more time. But alpha and omega is that we create social bonds to each other. If we know each other better, it will be more natural to take care of each other. That's how it is in all relationships in life.” (Internal journal 2014 number 1).

The intention of introducing “soft values” and strengthening personal relationships was to support one of the crucial aims of the new programme: to change the attitude towards safety and approach safety issues in a new way. The general impression from interviews, workshops and internal journals and documents was that the attitude towards safety had indeed changed. The following phrases represent this opinion:

“It is an enormous change in how people think, people have a different attitude and they take the new employees with them.” (Interviewee)

“For us it is not about having better statistics, but about having another culture.” (Management - Internal journal 20012 number 2)

“When I’m offshore, I notice, looking at my colleagues, that we think safety in a different way today.”(Internal journal 2012 number 2)

“We have engaged employees and new programme ambassadors, we have decreased the number of incidents, it is allowed for us to report [incidents], the new programme has changed the culture, the culture is not the same as it was before.” (Interviewee)

In the policy documents, the programme was often described as a *journey* in which safety was not explicated as an ultimate goal but rather as *a way to think*. In that sense, safety becomes an integral part of working life and is perceived as a continuous process. This point of view was replicated in interviews, for example several employees at the workshop and during the interviews mentioned that the programme introduced a new way of approaching safety and focused on changing the overall attitude towards safety:

“The aim of the programme was to create a different focus on safety, we could see in the statistics that during the last 15-20 years there had been no big changes, the programme focuses on two areas: process safety and behaviour, but in a different way, we think about taking responsibility for each other, on the soft values, it is something new. We have observed good results and awareness became better in the organisation, we discuss things in a different way, it is a process which never ends, we are on a journey.” (Interviewee)

Overall, the employees experienced that the introduction of “soft values”, together with visible management and open dialogue, has “pushed” the attitude towards safety in the right direction and has supported cultural change within the organisation.

4.3 Creating a shared culture?

One of the essential aims of the programme was to create a culture in which all employees shared identical values and attitudes towards safety. In the past, the company had had some challenges regarding reluctance towards reporting incidents and a lack of employee participation in discussing safety issues (Rasmussen 2013, Rasmussen et al. 2013a, Rasmussen et al. 2014). Transparency, open dialogue, visible management and introducing ‘soft values’ were strategies to increase reporting. Additionally, teambuilding and sharing information and experiences were crucial activities to build notions of membership and a “sense of belonging” to the organisation. From the document analysis, it was for example evident that one key element was to build a culture characterised by unity:

“It is important for the further implementation of the programme that everybody in the organisation is at the same level, so all are updated on knowledge and the vision we have of the culture we wish to form in the company. We must welcome new colleagues and invite them to become part of the culture we are about to create.” (Internal journal 2012 number 3)

“I believe that across fields and in the whole organisation, we think about safety the same way, and so we perform tasks the same way.” (Internal journal 2012 number 2)

“One can say that the new programme gives us a common frame and a common language. It connects people to the same aim: to create a better business and a safer working place.” (Safety programme 2014)

Through the new programme, the company aimed to create a new and coherent culture, where the culture is seen as the “glue” of the organisation in which members share perceptions and behaviour, and serves as a compass that provides direction (Richter and Koch, 2004). However, the creation of a coherent, shared culture faced some challenges due to the geographical distribution of the various work units. The oil and gas company was organised with onshore offices and offshore installations, which each had their own culture of perceiving and practicing safety. Some of the respondents described it in the following way:

“One of the challenges in creating a shared culture was that the programme was mostly implemented offshore, and there was a gap between implementation of the programme offshore and what happens onshore where projects are planned.” (Interviewee)

“We should have the programme in mind when we make the important decisions onshore, but we have not seen it yet.”(Interviewee)

“We should have the programme also onshore and at the corporate level, we focus very much on personal safety, but we do not have enough attention on those huge mistakes that can cause an installation to explode. Do we make risk assessments of the right things; do we make decisions based on the right background? We are not there yet.” (Interviewee)

Other challenges in creating a shared culture were the high number of new and inexperienced employees from contracting companies. The workforce had expanded rapidly during the past few years, and many new employees did not have the same level of experience or knowledge as longer-term employees. This was challenging for more experienced employees, who felt they had to work harder to maintain a high safety standard:

“I don’t know where they are finding those new employees (..), they don’t know anything.” (Workshop notes)

“They think that they can send slaughterhouse employees for a three-week course and that that makes them competent, but it is not true, they don’t have the right attitude and we have to struggle with them offshore.” (Workshop notes)

“The worst thing with some of the new employees is that they don’t care at all; carelessness is very dangerous for safety.” (Workshop notes)

Although the company did consider to some extent that new employees should receive thorough training to obtain a high standard of safety knowledge and behaviour, it was not experienced as such among the permanent and experienced employees. It can thus be questioned whether a coherent and united culture does exist at all and whether the existence of sub-cultures and different divisions of ‘us’ and ‘them’ make it too fragmented. Creating a shared culture is time consuming and a continuous process. The work conditions at offshore installations that are characterised by short term projects with many new people working in limited time periods are challenging conditions when aiming to create a sense of community and shared identity.

4.4 Towards a safe future?

Attitude change, better relationships, more open dialogue and increased reporting have the aim to obtain a safer working place. According to an internal journal, the accident statistics decreased from 2010 to 2012:

“We can see that there have been less injuries since we started to work with the programme.” (Internal journal 2012 number 3)

However, in 2013 there was an increase in high potential incidents and injuries, which was a reason to start up refresh workshops and to continue working on maintaining the new programme. In that sense, there was an acknowledgement that forming a new safety culture was an ongoing and never-ending process. Building a new culture demands continuity. However, the intensity of the programme implementation changed from being very intense in the beginning to being almost non-existent. The employees were concerned that they did not have sufficient tools to be able to continue working with and maintaining the programme:

“It was a good process, but it is about focus and maintaining the programme all the time can be difficult.” (Interviewee)

“It is a challenge, what worked yesterday does not necessarily work today.” (Interviewee)

The employees and managers who were interviewed mentioned several areas that were not successful. The most frequently mentioned topics were lack of follow up, evaluation of activities and introduction of tools to develop the programme further. One of the responders said:

“We realised that you can change people’s programme, and you can be clear about your expectations of them towards safety, but you have to give them tools as well, you can’t tell people that you expect some things of them, but not give them the means to do it, (...) we have successfully moved some minds, but we really have not given people tools to back it up.” (Interviewee)

The participants at the workshops had similar opinions. Safety representatives, in particular, emphasised that they lacked the tools to be able to address the changes of attitude that occurred. Moreover, there were challenges related to learning from incidents and bringing past experiences into the future; this part was not very successful:

“We are trying to be a learning organisation; I think we learn from serious incidents, the investigations are conducted when there is a serious incident, especially in process safety, but learning from incidents related to personal behaviour, we don’t learn.” (Interviewee)

Some of the employees further mentioned that the programme was formulated quite broadly, which sometimes confused them. The broadness of the programme was intended to give space for flexibility, i.e. that each installation had the possibility to develop their own programme-related activities based on local perceptions

and practices. However, this intention was not experienced as being supportive for creating and maintaining a shared culture. Furthermore, there were complaints that the amount of information was insufficient, as the programme was not easily accessible on the company's website.

In summary, employees found the greatest challenge to be a clear communication strategy, particularly concerning the maintenance and continuation of the programme. The discussions about the programme's future were still ongoing at the time of this study, and there was no common understanding of the aim of the programme in the future.

5. DISCUSSION

The results of this study showed that the company succeeded to some degree with the implementation of the new programme. The participants emphasised that they felt supported by the management, and especially that the management took employee safety seriously. Management support and engagement in safety is very important for creating a positive safety culture and improving safety; the evidence of this can be found in many studies (Pidgeon & O'Leary, 2000; Reason, 1997; Mearns & Flin, 1995; Mearns, Flin, Gordon, & Fleming, 1998; Mearns, Flin, Gordon, & Fleming, 2001; Mearns, Rundmo, Gordon, & Fleming, 2004; Mearns & Flin, 1999). Moreover, the employees appreciated the emphasis on the soft values; the programme thus acknowledged that social well-being at work is an important component in being able to practice safety procedures. For example, one of the programme's key messages is that employees should intervene when safety is at risk. The underlying notion is that if employees do not trust or feel comfortable with each other, they are less likely to intervene.

The success of implementation is dependent on how well it fits the setting in which it is being implemented and how well the existing culture is characterised by shared ideas and norms (ACSNI, 1993). The results of this study show that the company aimed to move from a functionalist approach to a culture characterised by limited attention to employees' perspectives on an interpretative approach with increased attention to members and their understanding of culture (Rasmussen 2013). Through a focus on soft values, such as strong personal relationships, the company attempted to create a shared culture and minimise "us" and "them" subcultures. However, this kind of change takes time and it is crucial to pay attention to maintaining changes. A key challenge is when changes are sometimes necessary because of market forces like the oil price, and they then influence the specific working praxis locally due to a change in work activities and hiring new and cheaper labour. The changes within the organisation and the instability of employees cause a reduction in the feeling of being part of a shared and coherent culture. One important result then stands out as causing challenges to the success of the new programme: the number of new and inexperienced employees. According to some of the participants in this study, inexperienced employees jeopardised safety with carelessness and lack of skills. It may be argued that the new employees were not considered proper 'members' of the culture and therefore did not share the 'new safety culture' represented by the programme. This result indicates that more attention should be paid, not only to better educating new employees about the content of the programme, but also to integrating them in the existing work teams, emphasising reciprocity regarding trust and well-being between all employees. This may promote the 'sharedness' of the cultural norms. The programme has been successful in changing attitudes among the employees and has improved safety. Even though the programme has succeeded in many ways, the level of intensity in how the programme is being implemented has been decreasing. It is important to maintain the programme because awareness is usually highest at the beginning of the intervention and then slowly disappears over time (Zohar & Luria, 2003). Changing a culture is a slow process, and it is important to recognise the existing culture, what the opportunities are to change it, and who should be involved (Antonsen, 2009; Richter & Koch, 2004). Aaro and Lund have found that the most effective change is a mixture of structural changes and training based on a behavioural approach. It appears that the company represented in this study lacks both a clear structure, particularly regarding communication and maintenance, and also a clear educational focus for contract and other short-term employees. The challenge of every implementation of a new policy is how to keep the programme going and improve it at all times. Of particular importance is building a strategy to increase organisational learning, i.e. how the organisation learns from its experience to be able to build a safer future. There are three main processes in learning on organisational level from incidents: investigation and analysis of incidents, the use of lessons learned and sharing and storing the information (Drupsteen-Sint 2014). Several studies have emphasised the importance of sharing knowledge in the whole organisation to obtain organisational learning (Shein 1992 Koornneef et al. 2005, Drupsteen- Sint 2014), but also the organisational context in which learning takes place is an important factor (Drupsteen-Sint 2014).

6. CONCLUSION

This study has shown that building a safety culture as a component in safety and accident prevention programmes is a promising but challenging process. It is crucial that there is a transparent communication strategy

throughout the programme implementation, so that it is clear to the employees what the aim of the programme is and how it can be achieved. Moreover, it is critical to pay attention to the subgroups existing within the organisation in order to target the programme to all employees, including new hires and short-term employees. Another important issue is having an understanding that cultural change takes time, and it is important to maintain focus and encourage employees for changes to take effect.

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8. REFERENCES

- Advisory Committee on the Safety of Nuclear Installations (ACSNI) (1993). *Study on group human factors , Third report: Organising for safety*. London:HMSO.
- Alvesson, M. (2002). *Understanding Organisational Culture*. Los Angeles, London, New Dehli, Singapore, Washington DC: Sage.
- Antonsen, S. (2009). *Safety Culture: Theory, Method and Improvment*. Ashgate.
- Bazeley, P. & Jackson, K. (2013). *Quantitative data analysis with Nvivo*. Los Angeles, London, New Dehli, Singapore, Washington DC: Sage.
- Bettinghaus EP (1986) Health Promotion and the Knowledge-Attitude-Behavior Continuum. *Preventive medicine* 15, 475-491
- Chambers R (1997) *Whose reality counts? Putting the first last*. London: Intermediate Technology Publications.
- Cooke B & Khotari U (eds) (2001) *Participation. The new tyranny?* London: Zed Books.
- Cox, S. & Flin, R. (1998). Safety culture: philosopher's stone or man of straw? *Work and Stress*, 12, 189-201.
- DEA. (2012). (http://www.ens.dk/da-DK/UndergrundOgForsyning/Olie_og_gas/Oekonomi/Sider/Forside.aspx 22 June 2012 . Ref Type: Online Source
- Drupsteen-Sint L., (2014) *Improving organisational safety through better learning from incidents and accidents*, PhD Thesis, Centre for Industrial Production, Aalborg University
- Dyreborg J, Nielsen K., Kines P., Dziekanska A., Frydendall K.B., Bengtsen E., Rasmussen K. (2013) *Review af ulykkesforebyggelsen – review af den eksisterende videnskabelige litteratur om effekten af forskellige typer tiltage til forebyggelse af arbejdsulykker*, NFA <http://www.arbejdsmiljoforskning.dk/~media/Boeger-og-rapporter/2013-AMFF-SIPAW-Rapport-final-august.pdf>
- Fixsen DL, Naoom SF, Blase KA, Friedman RM and Wallace F (2005) *Implementation research: A synthesis of the literature*. Tampa, FL: University of Southern Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network (FMHI Publication #231).
- Glendon, A. I. & Stanton, N. A. (2000). Perspectives on safety culture. *Safety Science*, 34, 193-214.
- Goffman, E. (1959). *The presentation of self in everyday life*. Penguin Books.
- Graneheim U.H., Lundman B. (2003), Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness, *Nurse Education Today*, 24, 105-112.
- Guldenmund, F. W. (2000). The nature of safety culture: a review of theory and research. *Safety Science*, 34, 215-257.
- Hale, A. R. (2000). Culture's confusions. *Safety Science*, 34, 1-14.
- Hale, A. R. & Hovden, J. (1998). Managment and culture: the third age of safety. A review of approaches to organizational aspects of safety, health and enviroment. In A.M.Feyer & A. Williamson (Eds.), *Occupational Injury Risk, prevention and intervention* (pp. 129-167). Taylor & Francis.

- Koornneef, F., Hale, A. R., Dijk W. van (2005). Critical assessment of the organisational learning system of the fire service in response to fatal accidents to firemen. In: *Advanced in safety and reliability*, London: Taylor and Francis Group, p.1119-1123
- Ladekjær Larsen E & Stock C (2010) Capturing contrasted realities: integrating multiple perspectives of Danish community life in health promotion. *Health Promotion international* 26(1):14-22.
- Lund, J. & Aaro, L. E. (2004). Accident prevention. Presentation of a model placing emphasis on human, structural and cultural factors. *Safety Science*, 42, 271-324.
- Martin, J. (1992), *Cultures in Organizations: Three Perspectives*, Oxford University Press, London
- Mearns, K. & Flin, R. (1995). Risk Perception and Attitudes to Safety by Personnel in the Offshore Oil and Gas Industry - A Review. *Journal of Loss Prevention in the Process Industries*, 8, 299-305.
- Mearns, K., Flin, R., Gordon, R., & Fleming, M. (1998). Measuring the safety climate on offshore installations. *Work and Stress*, 12, 238-254.
- Mearns, K., Flin, R., Gordon, R., & Fleming, M. (2001). Human and organizational factors in offshore safety. *Work and Stress*, 15, 144-160.
- Mearns, K., Rundmo, T., Gordon, R. F. R., & Fleming, M. (2004). Evaluation of psychosocial and organizational factors in offshore safety: a comparative study. *Journal of Risk Research*, 7, 545-561.
- Mearns, K. J. & Flin, R. (1999). Assessing the state of organizational safety - Culture or climate? *Current Psychology*, 18, 5-17.
- Petersilia J (1990) Conditions that permit intensive supervision. *Crime and Delinquency* 36(1): 126-145.
- Pidgeon, N. & O'Leary, M. (2000). Man-made disasters: why technology and organizations (sometimes) fail. *Safety Science*, 34, 15-30.
- Rasmussen H.B. (2013) *Towards vision zero The possibilities and challenges for accident prevention in the Danish oil and gas industry*, PhD thesis, Centre of Maritime Health and Society, University of Southern Denmark
- Rasmussen H.B., Drupsteen L., Dyreborg J. (2013a) Can we use near-miss reports for accident prevention? A study in the oil and gas industry in Denmark. *Safety Science Monitor* 17, vol 2, 1-12.
- Rasmussen H. B., Hasle P., Andresen T. P., (2014) Safety representatives' roles and dilemmas in the Danish oil and gas industry. *Policy and Practice in Health and Safety* 1, 17-34.
- Reason, J. (1997). *Managing the Risk of Organizational Accidents*. Ashgate.
- Richter, A. & Koch, C. (2004). Integration, differentiation and ambiguity in safety cultures. *Safety Science*, 42, 703-722.
- Rogers EM (1983) *Diffusion of innovations*, 3rd edition, Free Press, New York.
- Shein, E. H. (1998) Organisasjonskultur og ledelse Er kulturendring mulig?, Libro Forlag, Oslo.
- Tharaldsen, J. E. (2011). *In Safety We Trust Safety, Risk and Trust in the North Sea Petroleum Industry*. Faculty of Social Science University of Stavanger.
- Tharaldsen, J. E., Olsen, E., & Rundmo, T. (2008). A longitudinal study of the safety climate on the Norwegian continental shelf. *Safety Science*, 46, 427-439.
- Zohar, D. & Luria, G. (2003). The use of supervisory practices as leverage to improve safety behavior: A cross-level intervention model. *Journal of Safety Research*, 34, 567-577.