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Mind the gap: a qualitative approach to assessing the distance between rules as imagined and rules as enacted

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ABSTRACT

Measuring the distance between compliance of rules as imagined and rules as enacted in high-risk environments has been an area of great interest and debate in recent years. Yet a significant gap in our understanding of the relationship between rules and routines, in practice, remains. Some authors have even advised us to “*stop bitching about the gap*” and start closing it (Hale & Borys, 2013a, p. 218). In this paper, we follow this call by investigating the relationship between safety rules and routines as imagined, and enacted, in a rule-driven organization working in the oil and gas industry in Norway. Specifically, we investigate how three different sub-cultures within the organization: the management culture, the engineering culture, and the operations culture - make sense of safety rules and routines at their respective levels, and why their interpretations of the same rules and routines, are different. These differences lead to different levels of rule enactment.

In this study, we attempted to identify the gap that exists between safety rules and routines within one organization on three different professional levels using an inductive approach. We found that how employees’ were engaged in the rule creation process led to different levels of psychological ownership, and this, in turn, led to different levels of rule enactment. We also found that these distinct occupational sub-cultures use different sensemaking approaches in understanding safety rules and routines, and that the resultant differences in understanding directly affects rule compliance. Each actors’ understanding of *routines in principle*, whether affected by positive or negative symbolic or instrumental sensemaking, is paramount to the alignment of rules and routines in organizations, and closing the compliance gap.

Keywords:

Routines in principle

Sensemaking

Compliance gap

1. Introduction

This paper focuses primarily on identifying the gap that exists between rules and routines as imagined and enacted (Hollnagel, 2014), and why these differ across different levels within an organization. It is an area of great interest for both researchers and practitioners alike but one that lacks clarity and agreement. “Routines are the primary means by which organizations get work done” (Feldman & Pentland, 2003, p. 94). While some routines emerge naturally, many are the result of attempts to control behavior, and create effective patterns of action (Pentland & Feldman, 2008). Yet, still we find that the level of control is unsatisfactory.

In many organizations, managers create a multitude of artifacts in the form of written documents, e.g. checklists, standard operation procedures and rules, and imagine that routines are going to be performed in alignment with the described behavior (Pentland & Feldman, 2008). However, much of the research, across many different industries, has found that rules and routines often drift apart (Reason, 1990, 1997; Decker, 2005), or are never aligned in the first place. Examples include: higher education (Feldman, 2003, Feldman & Pentland, 2003), car production (Becker & Zirpoli, 2008), seafaring (Knudsen, 2009), railway (Grote et al., 2009; Weichbrodt, 2013), firefighting (Weick, 1993), nuclear power plants (Bourrier, 1998), petroleum industry (Antonsen et al., 2008), and hospitals (McDonald et al., 2005; Wilhelm, 2014).

Enactment of rules is crucial to organizations, failure to do so can lead to poorer coordination and performance, in some cases accidents, and in the worst-case, death (Wilhelm, 2014). Because of this, organizations undertake great efforts (e.g. training, surveillance and/or sanctions) to assure that routine enactments are aligned with rules. Investigating the relationship between rules and routines is paramount because it can reveal deviant behaviors, which usually are hidden patterns of action (Becker & Zirpoli, 2008). However, not all deviations are harmful, or even undesired. Some deviations can be smarter ways of performing work, while others are dangerous. The goal must be to resolve the negative deviations and learn from the positive. The majority of the research listed above has investigated safety rules and their relationship with routines. However, the relationship is relevant to other organizational areas as well, e.g. production, quality and environment (Hale & Borys, 2013a).

In this paper, we investigate the relationship between written rules and routines in an international construction company engaged in the oil and gas industry at three different organizational levels. And even though there have been several recent research papers focusing on this relationship, authors have called for more field research, as the relationship is far from transparent (Hale & Borys, 2013b). In this study, we attempt to address three gaps. First, we attempt to further open the black box of organizational routines (Pentland & Feldman, 2005), and learn how individuals use different sensemaking approaches to understand their safety roles at different levels within an organization. Second, we attempt to align the findings between the research fields of safety science and organizational psychology to further expand our understanding of why individuals deviate from routines in principle. And third, to investigate how three different sub-cultures; the management culture, the engineering culture and the operations culture, make sense and interpret rules in a novel environment as research in the field of safety seldom investigates how power, and hierarchical differences, affect sensemaking of rules at different organizational levels.

2. Background

For this study, we have chosen a large Norwegian construction company operating primarily within the international oil and gas industry. We chose this company because they are a particularly “rule-driven” organization with an outstanding safety record, and conduct high-risk operations where rule compliance is both desirable, and is a requirement. Safety is claimed to be at the center of everything they do, along with it a large amount of rules, regulations, routines, and procedures. However, the gap that exists between the rules and routines as imagined and enacted are not clear, and difficult to address.

The company works on complex projects that are highly technical, time intensive, and involve many actors, both internal and external to the organization. Recently, the company has performed well on safety outcomes, such as work-hours without time-lost incidents, however the real level of safety is unclear. The company is considered a High Reliability Organization (HRO) described as organizations that are already performing at an extraordinary level of safety and productive capacity in the face of very demanding circumstances (Rochlin et al., 1987; La Porte, 1996; Weick et al., 1999), but these organizations are also at risk. The company, which we will call Constructor, is a knowledge-based, specialized engineering, procurement and construction company operating within the global oil and gas market. They are a subsidiary of a larger vendor, called Constructor Corporate.

Constructor designs and builds concrete constructions for large international oil and gas companies around the world, with current projects located in Canada and Russia. Often, when new projects are started, they create a new legal entity that varies in size, over time, depending upon the phase of construction, and where the largest projects employ over 2,000 people. Constructor does not conduct operations using only internal assets, but engages a network of different actors such as joint venture partners and subcontractors employing their own workers. Working with a network of subcontractors and their workers, instead of having permanent employees working at a construction yard, creates particular challenges in regards to safety rules (Oedewald & Gotcheva, 2015). As one top executive explained:

“We are a management company and we hire thousands of workers, and when they come in through the gates, they are served with rules and procedures: This is how you should work. We cannot go out in the street and ask them what they think. This is not a production company; there you can involve the workers more easily.”

Challenges aside, Constructor is performing well when it comes to different subjective safety measures. They have had over 17 million hours without a lost time incident. At the time of our data collection, it had been four years since the last fatality in the organization. This is in contrast to the years before when they averaged at least one fatality every other year. Our key informants accredited Constructor’s safety accomplishments to the hard work and effort they have invested towards safety. However, even though Constructor is performing well, they still have accidents and near misses that, under other circumstances, could have killed or severely injured someone. During the data collection period, one person died at one of Constructor Corporate’s other subsidiaries, reminding everyone that even with a great safety track record the company cannot rest on its laurels.

2.1 Rules and procedures

The oil and gas industry in Norway is a heavily regulated industry where organizations must comply with rules and procedures created with an aim to achieve safe work in a high-risk environment (Høivik et al., 2009). Since the beginning of the Norwegian oil and gas adventure in the late 1960's, the focus on safety, and with it a web of rules and procedures, has increased (Dahl, 2013). Since Constructor's projects are located abroad, they also have to adhere to local government safety rules and procedures creating an even more complex rule environment in which to navigate. The increased bureaucratization of safety, which revolves around hierarchy, specialization, division of labor, and formalized rules (Weber, 1978), has produced large dividends with regards to safer work environments, and with it, a decline in accidents (Dahl, 2013; Dekker, 2014). However, it has also brought with it some negative side effects in regards to reduced flexibility, and ability to respond to unexpected events (Dekker, 2014; Grote et al., 2009). To better understand how regulated the industry is, and how complex the rule environment Constructor has to navigate within, we have presented a description of how rules and procedures are created, and what forces affect the process. See Figure 1, below.

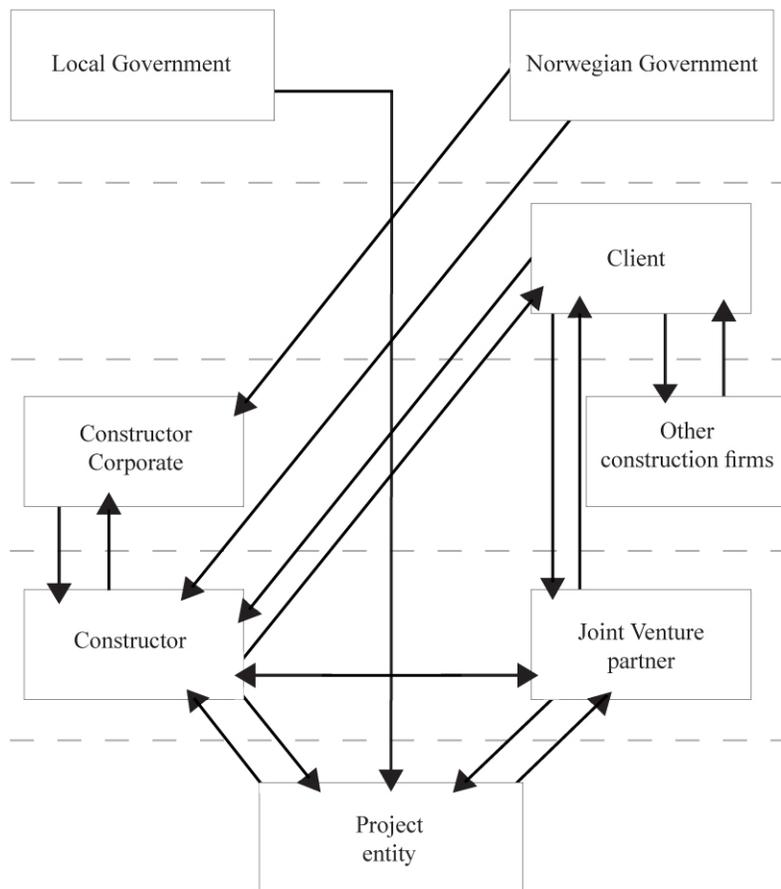


Figure 1 - Hierarchy of influencers on Constructor production of rules and procedures.

The majority of Constructor's rules and procedures are created in an attempt to comply with the demands set by their environment. Firstly, the organization has to comply with the national laws of the country in which they are operating. Most countries have strict laws demanding compliance from every company that operates in the oil and gas industry inside their borders. In Norway, companies have to comply with the laws imposed by the Norwegian Petroleum Safety Authorities (in addition to other Norwegian laws such as the Working Environment Act, etc.), which in short, demand a high focus on health, safety and environment (HSE), and a safety management system that ensures compliance.

Secondly, Constructor builds large concrete constructions for international oil companies, and even though they have multiple common denominators, they all have their own set of rules and procedures based on best practices created over years of experience. The oil companies work with several other companies on different projects, and all of these projects create new best practices that are transferred over to the oil companies, and they update their own rules and procedures. This again affects Constructor's rules and procedures because they have to adapt based on client demands. Achieving high levels of HSE is crucial for competing in the oil and gas industry. Without the right level of HSE commitment, the organization will not receive new projects.

Thirdly, Constructor has to comply with Constructor Corporate rules and procedures. In the same way as the oil companies, Constructor Corporate generated, over time, best practice in regards to HSE from their worldwide projects. Constructor Corporate has multiple subsidiaries in the oil and gas industry, all generate best practices that are used to update the rules and procedures at the corporate level.

2.2 Breeding of new rules

A part of the demands from the Norwegian Petroleum Safety Authorities, are that companies need to continuously improve their efforts to achieve high levels of HSE. As a part of this effort, Constructor performs a management review on a regular basis. The process entails reviewing previous incidents and investigating to determine if the rules and procedures sufficiently cover future scenarios. If not, new rules and procedures are created.

2.3 Employee compliance

One of the Health, Safety, and Environment (HSE) department's most important responsibilities is to create tools and methods that communicate and translate the content in the master document downwards in the organization.

“We don't expect the individual operator to know what the master documents contain, this book is written in a semi-legal fashion; written in a difficult way. The information in the document is translated into a more specific book, which again is translated into an even more specific book.”

As described above, this translation process creates more artifacts, which have to be managed and communicated to the employees that are meant to comply with these rules and procedures. However, the complexity of operations, and the dynamic, adaptive behavior of complex systems, can lead to a communication gap (Rasmussen and Lundell, 2012). As one can imagine, Constructor has a multitude of rules, regulations and routines within the organization

that are intended to affect how employees conduct routines. In the remainder of this paper, we will attempt to illuminate some aspects of the rule-routine relationship at Constructor.

3. Literature review

For this paper, we present four theoretical concepts: organizational routines, sensemaking, organizational culture, and psychological ownership. Key academic areas of interest within these areas are covered, specifically how organizational routines and rules are linked, and how the process of sensemaking of rules is related to routines. In addition, we look at how organizational culture is linked to differences in individual sensemaking of safety rules. And finally, we investigate how employee participation affects the rule-routine relationship, and is put forth as a potential factor for creating psychological ownership.

3.1 Routines

The concept of routines has been theorized and studied in organizations since the early 1940`s, and different conceptualizations have emerged (Becker, 2004). Routines have been compared to individual habits (Simon, 1965), programs or scripts (March & Simon, 1958; Cyert & March, 1963), and DNA (Nelson & Winter, 1982). Researchers have focused on one major issue: whether routines lead to stability or change (Bruns, 2009). Some argue that routines lead to inertia (e.g. Hannan and Freeman, 1984), which stem from theories of bureaucracy (Weber, 1978) with its defining features of regularity and continuity. Others argue routines lead to change and flexibility (Feldman & Pentland, 2003; Feldman & Rafaeli, 2002; Gersick & Hackman, 1990; Howard-Grenville, 2005), and build this argument around agency. Feldman and Pentland (2003) argue that organizational routines are a generative system with internal structures and dynamics, and this paper will follow their conceptualization and definition of organizational routines as: “repetitive, recognizable patterns of interdependent actions, carried out by multiple actors” (p.94). Several scholars (e.g. Feldman & Pentland, 2003; Becker, 2005; Grote et al., 2009; Reynaud, 2005) describe an interdependent duality of routines: between the idea of the routine, and what is actually done in practice, that are coined the ostensive aspect and the performative aspect.

The ostensive aspect of the routine is “the ideal or schematic aspects of the routine” (Feldman & Pentland, 2003, p. 101). It contains what we typically think of as the structure, the manuscript of the routine, and/or the routine, in principle. It is important to specify that the ostensive perspective is not the same as formal safety rules and procedures. The formal safety rules and procedures are the ostensive aspect written down and codified as an artifact. The ostensive aspect enables people to guide, account for, and refer to specific performance of the routine. From here on out, this aspect will be referred to as the *routine in principle*.

The performative aspects of the routine, on the other hand, are specific actions, by specific people, at specific times and places that bring the routine to life (Feldman & Pentland, 2003). The actual ways that employees perform safety procedures or comply with safety rules. From here on, this aspect will be referred to as the *routine in practice*. The relationship between *routines in principle* and *routines in practice* creates a continuous possibility for variation, selection, and retention of new practices and patterns of action within routines. The two aspects allow routines to generate a wide range of outcomes, from apparent stability to considerable change (Feldman & Pentland, 2003). The *routine in principle* creates and enables performance; performance creates

and recreates the *routine in principle*. Figure 2 below, shows the dynamics between the artifacts, *routine in principle*, and *routine in practice*.

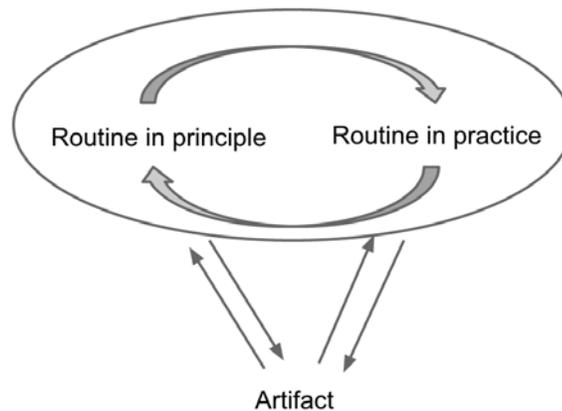


Figure 2 – Organizational routines, based on Feldman and Pentland (2003) model

3.2 Rules as artifacts

Feldman and Pentland (2003) present artifacts as representations of both the *routine in principle* and *routine in practice*. Artifacts do not necessarily lead to changes in patterns of action, e.g. formal safety rules do not always lead to compliance (Hale & Borys, 2013a; Pentland & Feldman, 2008; Weichbrodt, 2013). Rules have multiple functions in organizations (Weichbrodt, 2013). They are used as a tool to obtain organizational control, which is defined as “any process whereby managers direct attention, motivate, and encourage organizational members to act in ways desirable to achieving the organization’s objectives” (Cardinal et al., 2004, p.56-57). Because of this, rules entail a form of power (Mintzberg, 1983). The individuals involved in the creation of rules have the power to support and constrain other organizational members’ behavior. Rules also function as a coordination mechanism. Organizations use rules to “achieve coordinated behavior through creating a mutual understanding of task requirements, shared expectations, and predictability of work processes” (Weichbrodt, 2013, p. 31).

A third function of rules is to store organizational knowledge. Instead of creating a new solution when a problem occurs, workers can apply a rule, and through that, make use of stored organizational knowledge (Weichbrodt, 2013). Hale and Swuste (1998) created a useful distinction between different types of rules. The three different categories express the amount of freedom they give to the rule-followers (Hale & Borys, 2013):

1. Performance goals: “Which define only what has to be achieved and not how it must be done” (p. 209). These rules could be stated in numbers such as zero fatal accidents or under 2% near miss accidents.
2. Process rules: “Which define the process by which the person or organization should arrive at the way they will operate, but still leaves considerable freedom about what

that operation will be” (p.209). These rules describe requirements and guidelines for performing specific processes such as risk assessment or accident scene management.

3. Action rules: “Which specify in terms of ‘If – Then’ statements exactly how people shall behave...” (p.210). For example, wearing a helmet on a construction site, measuring oxygen in confined spaces before entering, or taking on gloves before helping someone wounded.

3.3 Importance of the routine in principle and sensemaking of rules

Several scholars (e.g. Weichbrodt, 2013; Pentland & Feldman, 2008) have described the importance of the *routine in principle* in regards to creating alignment between artifacts and routines. It is the *routine in principle* that is the key to managing the limitedness of formal written rules and procedures (Weichbrodt, 2013). For every rule written, there is a *routine in principle*, an idea from the rule-maker, a particular way of doing things that is supposed to become the regular way of doing things. Experience in enacting a specific written rule creates, maintains, or modifies the *routine in principle* to either incorporate or reject the written rule as a part of the idea of the routine (Pentland and Feldman, 2005; 2008). If the written rules fail to achieve the intended outcome, routine performers should be less inclined to enact the written rules (Feldman, 2000; Desai, 2010).

Written rules and procedures prescribe how employees should perform an organizational routine (Schulz, 2008). Before rules can become routines, they must be interpreted through a process of sensemaking (Reynard, 2005). Rafaeli & Vilnai-Yavetz (2004) postulate that sensemaking is made on three different dimensions: aesthetic, instrumental and symbolic. Aesthetic relates to our sensory reaction to an artifact and entails if we find it appealing or not. Instrumental is about the usefulness, whether the artifact supports or hampers work activities. Symbolic “regards the associations elicited by an artifact” (Rafaeli & Vilnai-Yavetz, 2004, p. 673). What messages and meanings are the artifacts carrying? In this paper, we will focus on the symbolic and instrumental dimensions of sensemaking because the aesthetic dimension has been found to be less relevant in the rule-routine relationship (Heimer, 2008).

We claim that by understanding organizational actors’ sensemaking of the safety rules in the symbolic and instrumental dimensions, one can better understand how the *routine in principle* is created, and modified. Differences in symbolic and instrumental sensemaking could lead to differences in meaning of the *routine in principle* amongst organizational members. The *routine in principle* should not be thought of as one single entity: among different organizational actors, there may be different mechanisms for sensemaking of the safety rules. These competing reasoning`s become apparent in actors’ *routine in principle* (their idea of the routines), because of different ways of sensemaking safety rules (Weichbrodt, 2013). Thus, differences in sensemaking, and ascribed meaning within an organization (e.g. among different professional groups), have to be accounted for.

3.4 Sensemaking and organizational culture

Sensemaking of similar artifacts differs across organizations (Pentland et al., 2010; Hale & Borys, 2013a). Schein’s (1996) definition of organizational culture can help us understand how that happens: “a set of basic tacit assumptions about how the world is and ought to be, that a group of people share, and that determines their perception, thoughts, feelings, and to some

degree, their overt behavior” (p.11). Schein (1996) argued that organizations have a common culture and different sub-cultures, e.g. management culture, engineering-culture and operations-culture, and they all make sense of artifacts, e.g. written rules and procedures, in different ways.

Weichbrodt (2013) argues that to better understand the relationship between rules and routines, one also has to take into account the different abstract roles involved: rule-maker, rule-supervisor and rule-follower. The rule-maker can be a manager in an organization or an external governmental institution creating rules and procedures in which entire industries have to comply. The rule-supervisor, the rule-maker, and the rule-follower can be the same, however, in large organizations different participants hold different roles (Weichbrodt, 2013).

The rule-makers are typically members from the management culture, rule-followers from the operations-culture, and rule-supervisors caught in the middle somewhere in the hierarchy. The rule-maker, rule-supervisor and rule-follower can have similar or divergent perceptions of rules, and because of that, have different *routines in principle* (D’Adderio, 2008). Because of this, it is not difficult to imagine that rules and procedures created by off-site managers have an entirely different meaning for on-site workers. Several scholars have identified that the operations culture, the rule-followers, perceive themselves as “we” as workers, and the management culture as “them,” the rule-makers, who do not understand what is happening on the line (Knudsen, 2009; Antonsen et al., 2008). This can lead to a gap between the rule-makers perception of how work is to be performed (their *routine in principle*), which is based on written rules and procedures (artifacts), and the rule-followers, *routine in principle* and their actual behavior (*routine in practice*) (Dekker, 2005). McDonald et al. (2005) found that doctors had a negative perception of the use of rules while operating and argued they were relevant only to novices, while nurses viewed rules and procedures as positive, emphasizing their supportive function and ability to decrease uncertainty and stress. Weichbrodt (2013) found similar findings in the railway industry; however, there the difference in symbolic and instrumental sensemaking was between people working in different departments.

3.5 Safety culture

When discussing safety rules and organizational culture, it is natural to include the concept safety culture that can be considered a sub-culture within an overarching company culture (Lofquist, 2008; 2010). Although there are disagreements about the term safety culture, the concept is often referred to as a set of safety related attitudes, values or assumptions that are shared between the members of an organization (Guldemund, 2000). Scholars in the field of safety often study “one” culture, and argue that this safety culture could enhance safety performance (Guldemund, 2000). The traditional notions of safety culture often include models developed to grasp the culture of a coherent unit. As Silbey (2009) argues, “one is hard pressed to find a reference to power, group interests, conflict, or inequality in the literature promoting safety culture. This may be the most striking feature of this field” (p. 361). Antonsen (2009) also pointed out that safety culture studies seem to study a harmonious view of the organization analyzed. In line with the latter scholars, we argue that looking at the safety culture as only one, overarching culture, could result in shortcomings in understanding the true nature of the safety culture. Thus, limiting our insight into the different members’ sensemaking of written rules and procedures.

By exploring the sub-cultures’ sensemaking across different levels, we can gain insight into the underlying logics of the dynamics in the organization. We claim that by understanding this logic, we can understand the dimension between the written rules and procedures, and the

routines in principle. Whom people think they are in their context shapes what they enact and how they interpret the rules and procedures (Weick, 1993). And ultimately, by understanding the different safety sub-cultures' sensemaking of the artifacts, one can come one step closer to managing the gap between written rules and routines.

3.6 Gaps

3.6.1 Three gaps. Borys (2012) postulates that there can be three different gaps in an organization: first, a compliance gap between written rules and procedures and work done, second, an adequacy gap between written rules and procedures and the reality of the task demands, and third, a competency gap between work done and the demands of the task at hand. In this paper, we will focus on the compliance gap, in particular, how the process of sensemaking of safety rules affects this gap. If this gap goes unattended, the line-workers may create informal work systems, that can create a situation where the routines (both in principle and practice) drift away from written rules and procedures (Snook, 2002; Dekker, 2011).

3.6.2 Managing the gap. The research community focusing on the rule-routine relationship has stated that we now know that the gap exists, and now we must figure out how to manage it (Dekker, 2005; Knudsen, 2009; Hale & Borys, 2013a). It is important to emphasize that the aim is to manage the gap, because closing it completely is impossible, and if it were not, it would leave little flexibility to adjust to changes in the environment. Several scholars have investigated different factors that affect the gap between written rules and routines: institutional pressure (Wilhelm, 2014), complexity of work (Wilhelm, 2014), and rules (Antonsen et al., 2008), frequency (Wilhelm, 2014; Feldman & Pentland, 2003), work experience (McDonald et al., 2005; Knudsen, 2009; Wilhelm, 2014), and leaders behavior (Feldman, 2003; Dahl, 2013).

Even though there are several factors that can affect the relationship between rules and routines, Embrey's (1999) explanation of "best practice" still holds: First, the rules must work, and second, they must be acceptable to those using them. The former relates to the instrumentality of the rules, do the workers perceive the rules as artifacts that support them in their daily work? The latter relates to whether or not the employees have a voice in regards to rule-creation. Rule-followers' involvement have several effects (Antonsen et al., 2008): first, being involved increases psychological ownership, second, involvement creates dialog between rule-followers and rule-makers which will give rule-makers insight in what actually is going on. Third, the increased dialogue will give the rule-makers multiple possibilities to explain the underlying thoughts behind the rules and procedures, that they are a means to an end, which is safety, and not only a way to avoid liability. Fourth, worker involvement will better adjust the rules to the environment making them more relevant and supporting.

3.7 Psychological ownership

Psychological ownership has proven to be a key-concept when it comes to understanding the rules-routines relationship (Weichbrodt, 2013; Antonsen, et al., 2008; Hale & Borys, 2013a). "The core of psychological ownership is the feeling of possessiveness, and of being psychologically tied to an object" (Pierce et al., 2001, p.299). Ownership allows individuals to fulfill three human needs: efficaciousness, self-identity and belonging (Pierce et al., 2001). Psychological ownership emerges in three different ways first, when participants are able to

control the target. The greater the degree of control, the more the target is regarded as part of the self. In contrast, objects controlled by others are not perceived as part of the self (Pierce et al., 2001). Ownership creates a sense of right to information about the target and a voice in decisions that impact the target (Kubzansky & Druskat, 1993; Pierce et al., 1991).

Several researchers have found that the gap between *routines in principle* and *routines in practice* is smaller if the rule-follower is allowed to participate in the process of rule-making (Hale & Borys, 2013b; Dekker, 2005, Antonsen et al., 2008). However, other researchers (Borys 2012; Bax et al., 1998) found that workers did not necessarily need to participate in the writing of rules; the most important was having a voice.

Second, when actors get to intimately know the target, increased association with an object increases ownership. The bad news for managers is that information may not be sufficient to create a sense of ownership (Pierce et al., 2001). Therefore, purely informing the employees about the rules is not enough. In their research on how safety management systems are communicated in organizations, Wold and Laumann (2014) found that the rule-makers and rule-supervisors have easy access to written rules and procedures, and through that, more interactions than the rule-followers creating a barrier for incorporating rules into routines.

Third, investing the self in the target. When employees invest energy and labor into work, they start to feel ownership of the target produced. The most powerful means by which individuals invest themselves into an object is by creating them (Pierce et al., 2001).

Managers can feel psychological ownership towards the rules they created, and through that, resist letting the line-workers be involved in the process of rule-making. The line-workers, on the other hand, might be protecting their work, and through that refuse to accept the management's interventions or experience it with negative connotations (Knudsen, 2009). The trend is that the creation of rules is becoming more and more separated from operational work (Dekker, 2014). This creates a situation where the third route to psychological ownership is blocked by increased specialization of labor. The increased bureaucratization of safety has created a situation where the local knowledge of practitioners is marginalized in regards to creating safe work environments (Knudsen, 2009; Almklov et al., 2014). It is clear that the concept of psychological ownership has positive and negative aspects connected to it. Increased psychological ownership creates a sense of increased responsibility in employees (Pierce et al., 2001). However, it can also create difficulties where the actor's feeling of ownership can be overly possessive, which can impede cooperation.

3.8. Research questions

This paper's main goal is to explore how sensemaking amongst three distinct sub-cultures affects the relationship between written rules (artifacts) and *routines in principle*. Antonsen et al. (2008) emphasize that friction between the different sub-cultures and roles inside organizations is important to investigate if one wishes to illuminate the rule-routine relationship. Organizational participants need to make sense of rules before they can be enacted as routines (Reynard, 2005). And, the different roles (Weichbrodt, 2013) and cultures (Schein, 1996) often make sense of artifacts in different ways. This leads us to our first research question:

How do the different sub-cultures: the management culture, the engineering culture and the operations culture, make sense of safety rules and procedures?

Rule-followers participation in the rule-creation has been found to have positive effect on the rule-routine relationship (Antonsen et al., 2008), and has been identified as the strongest building block towards creating psychological ownership towards safety rules among employees (Pierce et al., 2001). These findings have inspired our second research question:

How are the different sub-cultures involved in the rule-creation process at Constructor, and how does this affect the creation of psychological ownership?

4. Methodology

In this part of the paper, we will address the methodological issues of the study, and will cover the research design, data collection, data coding, ethical considerations, and analysis. The choice of research design will be presented by first exploring the research problem, and the specific methodological considerations taken into account.

4.1 Research design

Effective safety operations stem from different factors, and are complex in their nature (Hale & Borys, 2013a). Failure to recognize this complexity when conducting research can bias the results. Thus, a design that captures this complexity and takes this into consideration, is necessary, therefore an exploratory case study design was chosen. Case studies allow for investigation of social phenomena where boundaries between the phenomena of interest, and their context, are vague (Yin, 2014). By using an exploratory case design, we can better understand the world as seen by the respondents rather than a rigid predetermined framework (Silverman, 2013).

When investigating organizational routines, the majority of scholars (e.g. Feldman, 2003; Feldman & Pentland, 2008; Grote et al., 2009; Weichbrodt, 2013; Wilhelm, 2014) investigate all three elements of Feldman and Pentland's (2003) conceptualization of routines: artifacts, the *routines in principle* and the *routines in practice*. These projects stretched over several months, sometimes years, and the researchers performed some kind of observation of actual work performed to capture the *routines in practice*. Because of limited time available, and the theoretical background, this study had a smaller scope, and focused primarily on the relationship between the artifacts and the *routines in principle*. Borys (2012) has shown that even without observation, researchers can find enough data to analyze the rule-routine relationship. Considering other researchers' (Feldman & Pentland, 2008; Weichbrodt, 2013) description of the *routine in principle's* importance, we are confident that our findings will be of relevance.

4.2 Data collection

At the start of the project, we had several meetings with the HSE department at Constructor to determine the scope and goals for the study. Their initial goal for the study was to get someone to look at how Constructor could better work with their rules and procedures to measure compliance, and improve their level of safety. It was emphasized that we should keep our roles as neutral researchers, rather than being seen as safety deputies on a mission for the HSE department. Procedures for how to choose the sample, and method for the study, were discussed. In-depth, semi-structured interviews were chosen, and a tentative time schedule was set up. Throughout the process, we had continuous dialogue over phone, e-mail and face-to-face

meetings with our key informants at Constructor. Additional information was obtained through access to the organization's intranet and paper copies of rules and procedures. We also attended all HSE online courses required to work in the company. This provided us with an additional understanding of the approach to safe work practices the company promotes and relevant terminology.

Data was collected using semi-structured interviews based on our most important concepts that are known to cover fairly specific topics (Bryman & Bell, 2011), and gave us the opportunity to explore the informants' subjective experiences and understandings. In the process leading up to the main sample interviews, we conducted interviews with key informants in the HSE department, this to gain knowledge about company-specific terms and systems, and to validate the formulation of questions to be used later. These interviews proved very useful and became a part of the primary data-collection. A semi-structured interview guide was developed and used to ensure that relevant questions were raised, and to maintain some extent of scope and direction. There could be some deviance from the interview-guide to follow up on specific topics or to clarify answers from the subjects (Bryman & Bell, 2011). However, the same questions and wording were used across all of the interviews. It was important in this study to get the informants to express their own views on the topics, thus we tried our best to ask open-ended questions. Open-ended questions are suitable when wanting to learn how the respondents are thinking and their reflections on the subject at hand and allow the researcher to clear up misunderstandings and ask the respondents for their rationale for answering in a certain way (Bryman & Bell, 2011).

In order for researchers to conduct valid and reliable open interviews, they have to be aware of their own points of view and perception of the subject. This in order to try to be as objective as possible, and let the informants speak freely without judging or letting one's own opinions color the conversation (Silverman, 2013). In our study, we tried our best to not lead the informants by asking leading questions. Scholars in the safety management field have argued that measuring safety culture with questionnaires can limit insight into the deeper aspects and the true face of the safety culture (Flin, 2007). Respondents might see the questionnaires as safety audits. We also experienced this, as many of the respondents were eager to show their commitment to the safety rules and procedures in the beginning of the interview, however after understanding our neutral role as researchers, they opened up also expressing shortcomings in their own safety work. Consequently, we made an effort to create an open atmosphere during the interviews in order to make the informants feel safe. They were informed about us signing a confidentiality agreement with Constructor, and that the content of the interviews could not be traced back to them.

We conducted sixteen interviews in total, fourteen interviews face-to-face at the company's head office in Oslo during a period of two months between February and March of 2015. One of the interviews was conducted by phone, and one interview via video conference. The participants were briefly informed about the topic of our study, but gained no insight into specific research questions. Further, an explanation of how the interview data would be used was given. We then gave the informants a brief introduction about our academic and professional backgrounds, and the institution to which we belonged. All of the interviews ended up with an open question of whether the informant felt that they had been given the chance to elaborate on the topics, and if he or she had additional comments to make. All interviews were digitally recorded to ensure accuracy and validity, and the respondents were informed that the recordings would only be used for transcription and later deleted.

4.3 Sample

When investigating the rule-routine relationship it is common to focus on the employees working on the line, especially if the research involves safety. It is those individuals, specifically, who face dangerous situations and strict rules in their everyday work life. In their research on network organizations and safety culture, Oedewald and Gotcheva (2015) postulated that even though it is tempting to only focus on the individuals working at the sharp-end, it is also important to investigate the employees working in the management of the company, as well. This is because these are the actors who have the largest impact on safety culture development, and the network's ability to learn from successes and mistakes.

On projects, Constructor imposes rules and procedures, and expect compliance from the subcontractors. Because of the organizational barriers between Constructor and the subcontractors, it is difficult for the company to create and invest in a safety culture for the whole network in the same way it can inside the borders of Constructor. Therefore, the people working for the management company are important. Through their daily contact with subcontractors and project workers, they influence how other parts of the network understand and make sense of the safety rules. Therefore, it is important that the different sub-cultures of Constructor make sense of the safety rules in a similar way so that they communicate a joint understanding towards the subcontractors and business partners.

Our sample consisted of employees working in Constructor's different sub-cultures: management, engineering and operations. The participants were selected by the means of purposive sampling (Bryman & Bell, 2011) with assistance from the HSE department. This means that the respondents were not selected randomly, but instead, selected by the researchers and the HSE department using predefined criteria that fit with the objective of the study.

To decide which culture the employees belonged to, we used their formal positions and their self-perception of where in the hierarchy they belonged. We also coded the statements according to where we meant the statements belonged, when cross-examining the two coding methods, the results were aligned. Thus, strengthening the validity of it actually being three distinct sub-cultures. The sample consists of 16 employees, 6 informants from the management culture, 5 informants from the engineering-culture, and 5 informants from the operations-culture.

4.4. Data analysis and coding

The transcription of the data was conducted using the qualitative data analysis software MAXQDA11. The aim of the data analysis in stage I was to find themes emerging from the interviews and identifying specific ways of sensemaking the safety rules amongst the different sub-cultures. Data analysis in stage 1 was conducted using open coding, allowing for openness in the data, to ensure that thoughts, ideas and meanings were revealed (Silverman, 2013). The open coding allowed for novelty amongst the sub-cultures in the sensemaking of the safety rules. What was emphasized by one sub-culture need not be important for the others. In stage II, we arranged the data more directly to the theoretical concepts, instrumental and symbolic sensemaking, and psychological ownership. These two stages gave the basis for the results in the findings section of the paper. An important reliability test in our study was whether the coders would code data from different informants into similar emergent codes, and then into the theoretical concepts codes. To minimize error variance, we continuously discussed codes and emergent themes after every coded interview. We discussed disagreements and mutual understandings until we reached a consensus of the codes in question. After 5 interviews, we had developed a shared understanding of the method and coded quite similarly, thus we coded the remaining interviews independently.

4.5 Ethical considerations

Having presented our methodological approach, and how the procedure of the study would proceed in practice, we will now present some ethical considerations. Participation in the study was voluntary, and all participants were ensured confidentiality of any gathered information. The participants were informed about our signing of a confidentiality agreement with Constructor, and that their statements could not be traced back to them. The informants were also given the opportunity to withdraw at any time without stating any reason for their withdrawal.

5. Analysis & findings

The analysis and findings section is divided into three main sections. In the first section, rules as artifacts, we set the stage for what is to come by specifying which safety rules the different sub-cultures relate to, and what roles they have in the rules-hierarchy. In the second section, we present the different sub-cultures' sensemaking of the safety rules on the instrumental and symbolic dimensions answering our first research question. Each sub-culture is presented separately, and their sensemaking is summarized, compared and contrasted at the end. Lastly, in the third section, we elaborate on the gap present between the safety rules and routines, how the employees in the case organization participate in rule creation and how this affects psychological ownership, answering our second research question.

5.1 Rules as artifacts

Before we could investigate how the different sub-cultures in Constructor make sense of rules and procedures, we had to investigate what different types of artifacts the participants in our sample relate to in their daily work. We also elaborate on which role the different cultures have in the rule-hierarchy.

5.1.1 Different cultures different roles. Weichbrodt (2013) postulated that, to better understand the rule-routine relationship, one has to take into account the different abstract roles involved: the rule-maker, rule-supervisor and rule-follower. Although one organizational participant can hold all three roles, they are often divided between different cultures in organizations (Weichbrodt, 2013), for example, the management culture are usually the rule-makers, while the operations culture are the rule-followers. Our findings support the last statement, and we found that the cultures could be divided into different rule-roles, however, the picture was more complex than previous research literature has indicated, mostly because of the external actors' effect on rule-creation.

The management culture was composed of both rule-followers and rule-makers. The management culture had to follow the rules imposed on them by their external environment; however, internally in Constructor they were primarily rule-makers. Their role in the rule hierarchy was to create rules and procedures that translated and communicated external and internal rules downward in the organization.

The engineering culture was primarily rule-followers. During the interviews, it became apparent that they had to follow international safety rules and codes, coined technical safety, and internal safety rules created by the management culture. The engineers were also rule-makers in some situations as they created meta-statements that described how different designs were

supposed to be built during construction. We will categorize them in the rule-follower section throughout this paper.

The operations culture were primarily rule-followers. They have to comply with all the rules created by the management culture and the meta-statements created by the engineering culture. As we will later discuss, they are, to some extent, involved in the adaptation of rules during the performance of work, however, during the interviews they mainly discussed rules they had to comply with.

5.1.2. Different cultures different artifacts. Using Hale and Swuste's (1998) three different categories of rules; performance goals, process rules and action rules, we investigated what type of artifacts the three cultures related to in their daily work. All of the employees mentioned specific action rules they had to relate to during their daily work. Examples are that they had to submit two observational reports on average each month, and they had to hold the rail when walking in stairs. Even though every employee had to relate to some action rules, the daily work of the different cultures was dominated by different rule categories.

The management culture's daily work was dominated by performance goals. They had to deliver results on different key performance indicators (KPIs) such as lost time incident frequency (LTIF) and a total recordable incident frequency (TRIF). In line with Hale and Swuste's (1998) definition of performance goals, the goals were clearly defined, however, how the management culture was supposed to accomplish them was not.

The engineering culture's daily work was dominated by process rules. Their work revolved around designing and building concrete structures as efficiently and safely as possible. The design work was influenced by rules stated in international standards, which defined the design process, however, it also left considerable freedom for the engineers to improvise and adapt to changes in the environment.

The operation culture's daily work was dominated by action rules. During work, they complied to the several different rules that forced them to use harnesses when climbing scaffolds, wear protective goggles when using different tools, or having watchmen present when they were in confined spaces where there was gas present.

An overview of the different cultures and their dominant rule category is shown in Table 2 below. The fact that the different cultures are dominated by different rule categories impacts their sensemaking, which we will elaborate in more detail below.

5.1.3. Broad safety rules. Because the different cultures related to different categories of rules, our focus during the interviews was on safety rules and procedures, in general, and not on one specific rule. This gave us the opportunity to explore the broader sensemaking of the safety rules.

5.1.4. HSSE or Safety? Throughout the research literature, and in the industry, it is more common to use the abbreviation HSE (Health, Safety and Environment) but Constructor Corporate wanted to emphasize the importance of Security, and therefore introduced the term HSSE. During the interviews we used the abbreviation HSSE in our questions and the interviewees did the same in their answers, however, the topic was primarily about safety. We will use the term "Safety rule" to refer to any formal HSSE rule or procedure at Constructor for the rest of the paper.

5.2. Routine in principle – sensemaking of rules

As previously mentioned in the theory section of this paper, there is a *routine in principle* for every rule in the organization (Weichbrodt, 2013). And, as Reynard (2005) postulates, a rule must be made sense of before it can become a routine. The main purpose of exploring the different sub-cultures’ sensemaking of rules is to explore their *routine in principle*, how they understand the idea behind the safety rules. We wanted to investigate if they have a mutual understanding of the safety rules, if not, how do they differ? By understanding their sensemaking processes, we can achieve greater insight into the gap between written rules and *the routines in principle*, and how to manage it. This insight can be used to understand the difference between the rules and the *routine in practice*, the actual performance of the rules. As several scholars have found (e.g. Weichbrodt, 2013; Pentland & Feldman, 2008), it is through aligning the *routine in principle* that one can manage the limitedness of formal written rules (Weichbrodt, 2013).

As pointed out by Weichbrodt (2013, p. 109), “The process of artifact interpretation, both instrumentally and symbolically, is prone to a number of influences – one of which is the norms and values held by organizational actors belonging to different professions.” This is essentially what this paper is about: We show how the process of sensemaking in the instrumental and symbolic dimensions affect and create differences amongst the organizational sub-cultures routines in principle.

In the following sections we present the findings of each culture separately, the focus will be on the emergent themes coded during the data analysis. The instrumental and symbolic sensemaking (Rafaeli & Vilnai-Yavetz, 2004) of the safety rules are discussed. Instrumentality is about the usefulness of an artifact, and whether or not the artifact supports, or hampers, desired activities (Rafaeli & Vilnai-Yavetz, 2004). The symbolic dimension regards to the associations elicited by the artifacts, the safety rules (Rafaeli & Vilnai-Yavetz, 2004). As Schein (1996) has proclaimed, artifacts can carry a rich body of meanings and messages.

Even though the instrumental and symbolic dimensions are interchangeable, as they do not exclude each other (Rafaeli & Vilnai-Yavetz, 2004), we will discuss them separately. The findings are summarized, compared and contrasted in a separate section. In *Table 1* below, we have summarized the emergent themes in the instrumental and symbolic dimensions.

Table 1 Different rules and different sensemaking

<i>Culture</i>	<i>Rule category</i>	<i>Instrumentality</i>	<i>Symbolic</i>
Management	Performance	External Gain customers Protect firm Internal Create mindset Achieve safety	Top down (Positive) Up to the individual Challenging

Engineering	Process	External Gain customers Protect firm Internal Create mindset Design safe construction	Top down (positive) Up to the individual Not relevant and relevant
Operations	Action	External Governments and client demands hinder work and safety Internal Hinders and enables work	Bureaucracy Top down (negative) Not up to the individual

5.3. MANGEMENT CULTURE

As Schein (1996) points out, the management culture often manages large organizations, which can be experienced as an abstract and depersonalized system. The case organization is particularly abstract; it consists not only of the home organization, but also of a network of subcontractors and partners. For the management culture, this creates a need for formalization of rules and procedures to control the abstract system of routines in the organization (Schein, 1996).

The management-culture members are exposed to, and need to comply with the safety rules created by all the rule-influencers as shown in figure 1, thus their focus is on the organizational level, on numbers and trends, rather than action rules. In the interviews with the members of the management culture, they discussed how to manage the complex system of rules and procedures to ensure the employees' safety, keep business running, and maintain good relations with the clients.

5.3.1. Instrumentality. The management culture's instrumental sensemaking was two-sided. On one side, the safety rules are instruments to gain customers and protect the firm against liability, on the other side the safety rules are instruments to create a safety mindset, and achieve safe operations. We have divided their instrumental sensemaking into two sections, external and internal.

5.3.2. External influence. The external sensemaking relates to how the safety rules are used as tools to compete in the market place. Organizations that want to do business in the oil and gas industry need to have an excellent safety performance record, and in case of disasters, a web of rules that can shield them against possible liability.

5.3.3. Gain customers & protect firm. The informants in the management culture expressed an external driven sensemaking of the safety rules. To be competitive in today's market, it is essential to comply with the demands of the customer and government regulations. Safety is

reached through client compliance, and business with clients is reached through safety, and these processes are governed by the safety rules. They engage in meetings with the clients and are constantly challenged on the organization's safety rules and procedures. In their opinion, the company needs a rigorous system of rules and procedures that need to be documented, and accounted for, in internal and external audits. Their sensemaking of safety rules is that the organization's safety rules external function is to be a quality mark in the marketplace. In their sensemaking, the leaders accept safety rules that do not necessarily make sense to the operators. Part of their sensemaking is that they view the safety rules as artifacts written down and systematized to show external safety auditors and clients, and to protect the firm against liability.

“When you are a certified company you are audited once a year. Then, an external auditor visits and checks if everything is inside the standards of the certificate. Our goal when such an auditor arrives is to get the best score. When the auditor asks questions we do not tell lies, it is not allowed and not ethical. However, the questions that are asked are directed toward a specific procedure or manual, and that manual is written in a general fashion; it is a bit round. The auditor goes after statements that are written in the procedures. When you answer that this is how you do it, the auditor can ask for examples of when you have followed the procedure. Then we have to find documentations that prove that we have followed the procedures. If you are experienced at being audited, then you have the procedures available. Then you retrieve them and then you talk around the topic the question is directed towards. Then they understand that you have knowledge of the whole picture, but in those situations you are almost like a half-politician. You can answer in many different ways, you can choose to answer what he asks for or you can talk around the topic, so he gets the impression that you are in control, even though you know that this is something we need to work on internally. However this you keep to yourself. When we audit internally it is important that we do not fool ourselves. Then we are really after what is going on. When an external auditor arrives, once a year, it is something we just check off the “to-do” list, now we have the certificate, now the real work can begin.”

“In my experience the rules are created to enhance the firm's attractiveness, and this is done through safety - by living the rules. I have the perception that the customer is also concerned with the same. It is a safety aspect, but you also gain a competitive advantage.”

“It is the master document, extremely thick, it is this document we sign contracts with, it is this document we are being audited on by the government, it is this we check after incidents – we look and see, what does the procedures say?”

5.3.4. Internal influence. The internal sensemaking is that safety rules are instruments to create a safety mindset among the employees and achieve safety.

5.3.5. Achieve safety. The management culture understands that the safety rules created to comply with the external environment are too broad and general to achieve safety internally. Therefore, the management culture has to translate and communicate the safety rules to the employees downward in the organization.

“We don't expect the individual operator to know what the master document contains, this book is written in a semi-legal fashion, written in a difficult way, the information in the

document is translated into a more specific book, which again is translated into an even more specific book”

“How are we best going to equip these workers for the job they are going to have for 1 month. We don’t have a clear answer to that, but what we say to the customer is training, training, training, we can never have enough training. And that is to ensure that “nobody gets hurt” and that we do our job right.”

5.3.6. Create a safety mindset. Many of the leaders in the management culture expressed a positive safety mindset and positive attitudes towards the safety rules. It is evident that the management culture is very safety committed, or at least they express a mutual understanding that safety is a core value in the company. They argued that having a safety mindset would create ownership to the safety rules, which again would make employees work safely. They explicitly said that their safety mindset had developed over time.

“In the beginning I thought it was ridiculous, when you parked your car, it had to be with the rear end in, you had to hold the railing when walking in stairs. I felt that it was an over-focus, and when things get overly focused you reach a certain top, and you just think it is a bunch of crap, but then you realize that you have to live with it, and then you turn and find value in it. That point I feel we have reached here, especially me in the years I have been her. And that is because we have a totally different focus on Safety than anywhere else I have been.”

The management culture told stories about when their safety mindset had made them take action both in their private and professional life.

“One day when I was waiting for a cab on a business trip, I leaned on a streetlight, and I saw that the bolts were loose because a car had crashed into it. They had just raised it up, without fastening the bolts, I reported it to the local municipality and they fixed it.”

There were two distinct groups within the mindset category. One group emphasized that the company should over-focus on safety. They expressed that some employees would probably not like all the rules, which is too bad for them, because the over-focus works. The intensive focus on safety rules creates a safety mindset.

“If you really wish to reach a goal in a company it is extremely important to over-focus in a period so that it becomes a part of the attitude.”

The other group in the management culture expressed that the focus and safety rules need to be focused on “important” issues such as not losing employees instead of small aspects of everyday life.

“Let us try to focus on the things that will reduce injuries, it could too easily become about numbers. What I am trying to say is: focus on quality, not only numbers. If there is an over-focus on cups and lids, holding the rails when walking in stairs it could undermine the focus on the important things. Let us focus on the issues that hinder the loss of people.”

5.3.7. Symbolic. During the interviews with the management culture three main symbolic associations to the safety rules emerged. For them the safety rules meant a top-down approach to safety, that it was up to the individual employee to take responsibility for their own compliance, and that they found it challenging to navigate the external and internal demands with regards to safety rules.

5.3.8. Top-down approach. It also became apparent during the interviews that the management culture members have a top-down sensemaking of the rules; the rules and procedures come from the top and from knowledgeable people in the organization. Statements such as:

“The pressure needs to come from the top. Safety leaders need to be examples, it comes from the top.”

One reason for the top-down approach is the context in which the organization operates. Many operators are only employed for 1 or 2 months, many of the members of the management culture see it as a necessity to dictate certain aspects of safety rules. Another aspect of top-down symbolic sensemaking was that the workers were not competent enough to understand the rules. One informant said:

“I am sorry to say this, but some people are different, not because they are bad in any way, but they have chosen another career path, chosen to be out in the field. That makes a difference on how much energy you need to put into making people understand.”

Whereas another said:

“They follow rules to a certain degree, but they are humans, and you can never be sure about humans, and a lot of them are without education. And, I would claim, not that I am making a class distinction, but you meet a lot of strange people on site. And I have been out there on visits, and seen people working for 3-4 weeks in a row on 12 hours shifts, maybe more, with a long commute home in addition. Then it is ok to go over and say I think you need an extra hour break. Or go over to the foreman and say; that buddy of yours, I don't think he should climb up there now, he does not look fit.”

“A lot has to be read, and people are at different levels. The people, who are supposed to read the rules and procedures, often don't enjoy reading. I think if you look at the people that are at the bottom, the blue collar workers, the ones doing the real job, they get the rules and procedures, but they might not read so good.”

It was evident through the interviews with the management culture that they view leadership of core importance with regards to creation, distribution and supervision of rules and procedures. This further cements their top-down sensemaking. They view leadership as one of the cornerstones in translating the written rules and procedures downwards in the organization.

“The supervisor has to sit down with them (the operators) and explain: this and that way is how you use that specific procedure for that job. Welding procedures if you are a welder etc. This is systematically implemented. Everybody knows that you need a specific procedure to know the speed and the number of meters for different jobs. But you also have jobs where you need a general procedure. The question is how can we make them

better? And the answer is probably that we need to get the line-manager to simply pick out the few procedures that are relevant for that operator.”

“The line manager should work like this and that, this procedure (shows a book) describes how the line manager should work, how he should communicate. He is the one giving the procedures to the operators and tells them: this is your task. The line manager is the one that is out in the field. We tell them to work like this and that, it is important that it happens at line-manager level, this is how we distributed downward in the organization.”

5.3.10. Up to the individual. In the management culture there is solid agreement that operators, engineers and themselves need to be proactive in the search for information about rules and procedures.

One manager said:

“I use the intranet to update myself, and I also listen to the word of mouth spread throughout the organization. You must engage yourself to be at the forefront of the information, you cannot expect people to come in and knock on your door and talk about things, it is important to seek information.”

And another said:

“You cannot give them everything, if they face difficulties, they have networks; they will go through their managers, through their colleagues. Of course it leaves you to be a bit proactive as well, you need to go around and talk to people. It is up to me, to my networking skills. It is up to the individual.”

The other participants made similar statements as well. They focused on the networks they have within the organization. Many actors in the management culture also stated that they had good relations to specific employees in the HSSE department, empowering them to contribute, give feedback and change the system if they wanted to.

5.3.11. Challenging. To comply with external demands from clients and governmental agencies’, rigorous and broadly written rules must be created to assure that the company is in compliance, and protected against liability. At the same time, the management culture members expressed that the client and themselves want simplification to ensure effective operations. These conflicting demands were described as challenging by the management culture. Some of the leaders expressed concern about the rules and procedures being too broad and general, and that the organization needed to focus on specialization of rules. Thus, they are aware of the duality between broad external compliance, compared to specialized rules and procedures that are useful for the operators.

“To separate the important from the not important right? Be able to simplify a large amount of regulations to a manageable amount, to sharpen the rules. Now, when we are rolling out the campaign with our new rules we use pictures! Back in the day it was only text, text, text, but now it is more pictures, it’s about simplification.”

“Much more specialized, you are not supposed to remember everything, one has to specialize the rules in a language the operator understands.”

5.4. ENGINEERING CULTURE

According to Schein (1996, p. 6) “...every organization has one group that represents the basic design elements of the technology underlying the work of the organization and has the knowledge of how that technology is utilized.” Members of this group belong to the engineering culture, which according to Schein (1996) cuts across nations and industries. The shared assumptions of this culture are based on common education, work experience and job requirements (Schein, 1996). In our sample, we talked to engineers from different countries. And even though they were from Italy, France, Russia and Norway, their sensemaking of the safety rules in Constructor was relatively unified.

5.4.1 Instrumentality. With regards to the instrumental dimension, the Engineers were similar to the management culture, their sensemaking was that the safety rules are not only about achieving safety but also about complying with clients’ demands, achieving a competitive advantage and protecting the firm against liability.

5.4.2 External. The engineering culture understood how Constructor’s safety rules were an instrument to navigate in the external environment and not only about achieving safety.

5.4.3 Gain customers. When we interviewed the engineers they emphasized the importance of having rules in place to assure compliance to client and governmental demands.

Engineer:

“On the current project the standard is very high, and the client is very focused on safety, they have higher expectations concerning safety procedures and safety rules.”

“I think that the client have very high expectations concerning safety, if you want the contract you have to raise your safety level.”

Engineer:

“If you have a bad safety performance in today's market, you will not get new contracts.”

5.4.4. Protection of the firm. When we dug deeper into the safety rules, and their role in achieving other objectives than safety, the engineers responded that this was something that was common in the industry. That all the companies had in some way or another safety rules that are more about liability than achieving safety.

“Of course you have some procedures that is more about protecting the company in case something happens. This is not only Constructor, all the companies have such rules and procedures.”

“There is probably a part of the rules that exist to cover the company's back. I know that the client has rules and demands that only exist to cover their backs, and they are not trying to hide that fact.”

The engineers have to work with international and national rules and codes when they design the different constructions Constructor is building. The relationship between their daily work and the external environment can explain why the engineers make sense and accept that Constructor has to have safety rules in place, even though they exist for other purposes than safety.

”The design process is covered by international standards when it comes to safety. We have international standards as a reference; we don’t have any Constructor specific procedures that are moving the limit above the international standard. They are referring to international standards, so as long as you are fulfilling those, you are in the clear.”

”There are a lot of codes! We have to comply with laws and rules and codes. They are Norwegian and Canadian. The Canadian rules are more rigid than the ones we have.”

5.4.5 Internal. With regards to the internal instrumental sensemaking of rules, the engineers were also aligned with the management culture, however they had to comply with a different set of rules aimed at designing and calculating safe constructions. These rules affected their sensemaking.

5.4.6. Two identities and two sets of rules. When we asked the engineers about which safety rules they used, or were exposed to during their work life, they asked back “as an engineer or as an office worker?” It became apparent that the engineers had multiple organizational identities, and their answers varied dependent on which of them we directed the questions towards. As office workers, the rules were an instrument to create a mindset, while as engineers the safety rules were about designing safe concrete constructions.

5.4.7. Create mindset. As office workers, they did not have a clear concept of which safety rules they used or had to comply with in their daily work. They had examples of some office rules, such as holding the rail while walking on stairs, have a lid on their coffee cups, or submitting two observation reports on average each month.

”Basically it’s none. I know there are some procedures and there are some guidelines. But you don’t use them, you know that they are there; you know what they are about. You have read them, and signed that you understand them. I know what they are about, and they are very broad and very basic. So as long as people behave in a normal way they are basically fulfilling the guidelines and procedures. I know that they are there, but I don’t need to read them everyday because it’s just stating common normal behavior. It’s nothing very special that you need to remember. I actually don’t look at any procedure when I am doing my work.”

“When I arrived at the office it is like an initial introduction, an induction course where they explain basic rules that needs to be followed. This is something that you have to get familiar with, and you have to sign a form. Apart from that I have not actually gone through the rest of the procedures when it comes to safety.”

“It is not top of mind, to say the least. I notice that we have these things. Mostly I walk up a set of stairs, in an elevator, etc. I simply acknowledge that they exist.”

The engineers understand the underlying intention behind the safety office rules. It is about generating a safety mindset, to make the employees think about safety at work and at home, to make them mindful.

“The most important thing for me is the mindset. It takes a while before the mindset sets in, to think in that way, bring it from work and into your private life.”

“We should at all time, we the people who work here at the office, think about the workers who are supposed to use and build what you are designing. How would you like to have it on your building site? Think that maybe you are not the one that are supposed to work on the site or on the platform, but maybe someone you know or the children of someone you know are going to work there. Design it secure and safe.”

“In my experience, even if we make jokes about it, you still work here. My mindset changed, both at work and home; I have a different approach to safety now. They don’t teach you anything related to engineering work, it is really the mindset.”

5.4.8. Design safe constructions. As engineers, the participants had a much more precise conception of which safety rules they had to comply with, and the consequences for not following them were apparent. The safety rules they had to comply with were categorized under technical safety and not HSSE according to the engineers. For them the two concepts were distinctly separate.

“Technical safety is about what we are building, the rules and procedures we have to comply with when designing the platform. HSSE is about how we build the platform, not what we are building.”

When we interviewed the engineers, all of them were aware of how their work impacted the safety of the employees that are going to build the construction they are designing. However, the engineers differed with regards to how much they cared about safety rules at the office. This created a situation where an engineer can be the most safety aware worker at Constructor, meticulously planning his design, however since he is not holding the rails when walking in the stairs and delivering two observations a month, he can be perceived by outsiders as not having the right safety mindset.

5.4.9. Symbolic. When we interviewed the engineers, three different broad associations emerged: Top-down approach, up to the individual, and that the safety rules were both relevant and not relevant.

5.4.10. Top-down approach. Also, amongst the engineers, the focus on safety should come from the top. Many of them had experienced pressure and influence from their immediate leader on safety and following the written rules.

“The reason for my safety mindset is my leader, he has had an extreme focus on risk observations, and emphasized that this is actually something that you have to live with in this company.”

In engineering, the leadership aspects were mostly related to their immediate supervisor. Typically the supervisor would send them notifications via e-mail on submitting safety observations or looking at new procedures. It was their closest manager who was in charge of controlling their compliance to the safety rules.

”One time I remember he just pointed at me and said: shame on you, so little reports, do better!”

“He (the leader) sets clear criteria, after a period where I have not submitted reports, he is the first to knock on my door. I feel he follows up”

5.4.11. Up to the individual. The engineers agreed with the management culture that it was up to the individual to be proactive, to take responsibility, and to make sure that they are updated with regards to safety rules. The material is available, and it is up to the individual employee to ask around and learn how to navigate the information flow.

“It is like at the university, I remember one professor told me, we are not teaching you how to do things, but how to find things and how to find solutions, where to find information and procedures.”

“This is also an individual process, I mean, some people will be proactive and ask and search, other people do not really care, they just want to do it in their own way.”

5.4.12. Not relevant and relevant. As mentioned in the instrumentality section above, the engineers had two organizational identities, as office workers and as engineers, and the different identities affected their sensemaking. As office workers, they understood that the rules were an instrument to create a safety mindset, however they also viewed the rules as not particularly relevant for their work.

“Here they focus on small things, like holding the rails when walking the stairs and the dangers of spilling coffee. Here at the office we are taught that type of thinking; we have to be aware of safety issues. They teach us how to change our mindset with regards to safety. However they don’t give us any specific engineering or construction experience with regards to safety.”

Many of the engineers expressed that the safety rules (especially office rules) stand in the way of what is really important for them, namely the design of the structures. It hinders rather than enables work, what enables work for them is the technical safety rules. It seems the instrumental dimension creates a symbolic sensemaking that the safety rules are not as relevant for them as they are for the operators.

“Since I am doing analysis of structures I have to fulfill codes, deep knowledge of them is vital, basically these are keystones for my activities. More important to me is to understand codes, because it is very important that everything is under control, but that is safety which is integrated into design, the other part is safety that is integrated into private life and office work.”

5.5. OPERATIONS CULTURE

Compared to the two other sub-cultures, and because their work is dominated by action rules, the operations culture has a personal and closer relation to the safety rules. Building concrete structures in the oil & gas industry is complex and risky, and at the center are the operators building the structures hands-on. When safety rules are discussed within the organization, they are in focus. Their focus is on day-to-day activities within their domain at the construction site, e.g. lifting operations or work at height on scaffolds. Their attitudes, behavior and actions are at the center of the safety rules and procedures in the organization. The operations culture informants' work is highly interdependent, and based on teamwork. The operations culture in Constructor is a broad field of different disciplines that need to coordinate their work. No matter how carefully the operations are planned and calculated by the management and engineering culture, the operators are the ultimate agents making work happen (Schein, 1996). In the next section we will present the participants in the operations cultures sensemaking of safety rules.

5.5.1. Instrumentality. In the instrumental dimension, the operators also make sense of the rules in an external and internal fashion. The operators expressed that they try to comply with all the safety rules, and thus experience a constant struggle between rule compliance and practicality. They are constantly exposed to action rules dictating their behavior, at the same time they face operations that are constantly changing.

5.5.2. External. What was particularly interesting in this case was that the negative instrumental sensemaking was often directed towards external safety auditors from clients or standardization companies rather than internal management.

5.5.3. External demands hinder work. The operations culture discussed the role of the external environment in their aim to achieve desired activities. During the projects, they need to comply with a variety of rules from internal and external actors, and rules emerging during operations. The safety rules dictate their behavior, and give little room for improvisation. The operators are the culture that experiences the organization's high compliance level directly, and have to navigate all the rules that have been created. It was especially the rules imposed by third party inspectors that created a sense that the rules were more a hindrance than supportive.

“In Canada, there are so many, not stupid, but many precautions you have to take, which are practically impossible to follow, that’s why it really draws back the process and we lose time and money.”

“On Hebron there was one silly rule that came from the working in heights committee. We had a space that was considered a 100% hook up, when working at heights, but there was no possible way you could fall from it, it was maybe a gap of 5 cm on each side, it was a hanging deck, and if the deck fell, then everyone would fall down. It was a particular small area that got a 100 % hook up, nobody understood why, but the HSSE inspector from a third party inspection told us we had to follow it. Of course people, including the managerial staff, area never hooked up a 100 %. They entered the area quickly and went back, they did that behind the safety inspectors back.”

5.5.4. External demands hinder safety. The operators also talked about how the management culture attempts to achieve their performance goals affected their daily work. The informants talked about injuries being handled based on their impact on performance goals, and not about achieving what is best for the safety of the employees.

“It is normal that when you have a small injury on your finger, a cut, the foreman tells you: just use this first aid kit in the barrack or the container, don’t go to the clinic, because they will record you. This is what has happened, and keeps on happening. Some small injuries people prefer to hide, to avoid not ruin the numbers.”

5.5.5. Internal. The operators also indicated that the safety rules stemming from inside the organization sometimes hindered their work, however, they gave the impression that some of the rules made their work safer.

5.5.6. Hinder work. The operations culture actors see themselves as competent enough to see whether the rules and procedures hinder or enable their work. In the interviews, we found that many of the informants regarded some of the rules and procedures as hindering and lacking practicality. Some acknowledged that rules exist for their protection, but for many, some of the rules and procedures were rather ridiculous in terms of achieving their main objective: safety.

“We were supposed to use the work outfit that was handed out to us, we were not allowed to use jeans for example. That was a common rule that every one had to follow. The work outfits we were given were of poor quality, jeans fabric was of better quality and more appropriate. We also had to wear long sleeves and it was very hot that summer, we were not allowed to wear t-shirts. You feel that the rule originally is meant for working on refineries, with chemicals and such.”

“If they say it has to be done by then and then, and we have a schedule to follow, we in production say that it is not possible because of the way the rules are written. Sometimes they say it is okay, just follow the rules, we will pay what it costs, but there is no sense in that, a lot of the internal rules just cost enormous amounts of money”

5.5.7. Enable work. On the other end of the scale, the employees also expressed themselves positively with regards to safety rules; the rules also enable effective and safe operations. The operators are part of very complex and potentially dangerous work, and they understand the rules are created to ensure their safety.

“When it comes to the personal protective equipment, if it is a requirement in an area, I don’t break those rules. They are there to keep my body safe, nobody is pressing me against the wall to follow those.”

“It is quite common that people are against them at first: I am not into that, leave me alone. And then they start to get used to it. When they see that their hands and eyes are clean and intact, that they are healthy going back and forth from home to work, then they understand. Then they start to hunt for safety boots with steel toes, because they see that it is useful. One time I got my toe jammed under a box with 800kg. Why did it not hurt? The safety boot saved my foot. I keep telling that story to people with any doubt about why we

should wear PPE. Only once something has happened, through my 20 years of experience, but that is enough.”

5.5.8. Symbolic. On the symbolic dimension of sensemaking, the operations culture discussed three broad concepts. They felt the safety rules were bureaucratic, that they were written down only to exist in a master document, and not to achieve safety. Similar to the management and engineering cultures, they also had a top-down symbolic sensemaking, however, while the other two cultures had a positive perception, the operators viewed it as negative. The third concept was also in opposition to the other cultures. The operators felt that it was not up to the individual to be proactive about rules; they sensed that the HSSE-department and supervisors gave the safety rules to them.

5.5.9. Bureaucracy. The informants in the operations culture make sense of the rules as somewhat bureaucratic. They are seen as a compliance artifact, not necessarily for their own work tasks, but rather for management to protect them from legal conflict and for customer compliance.

“Many procedures are written just because they have to be in the master document register for the documents to be in order.”

5.5.10. Top down. During the interviews it became apparent that the implementation and communication of safety rules and procedures was characterized by a top-down approach, hindering involvement and effective operations.

“Yes sometimes it is a bit overkill. The rules are just pushed down our heads, but it is not really useful in production. It is just a decision; this is how it is, but it is not thought through in terms of practically.”

“The rules did not fit. The rules were pushed down on us; they were not discussed or thought through. It created a lot of frustration among the men. Then it was not preventative anymore, it worked against its purpose.”

5.5.11. Not up to the individual. While the other two sub-cultures in the organization acknowledged that it was up to them as individuals to be proactive and figure out what safety rules they needed to comply with, the operators painted a picture that indicated that it was up to supervisors and HSSE inspectors to provide the rules.

“They are presented to us, there are others who make and update our procedures and we are requested and required to follow, I have not been involved.”

5.6 Summary

In the section above, we have presented the findings on how the three different sub-cultures make sense of the safety rules both on the instrumental and symbolic dimensions. In line with previous research (Weichbrodt, 2013, Pentland et al., 2010; Hale & Borys, 2013a, Rafaeli & Vilnai-Yavetz, 2004) we also found differences in sensemaking of organizational artifacts. And in line with Schein's (1996) prediction, we found evidence of differences in sensemaking across occupational sub-cultures within one organization. The following sections discuss, compare and contrast these differences.

6. Discussion

6.1. Instrumentality. All the three sub-cultures have an internal and external instrumental sensemaking of safety rules. The management culture has a two-folded instrumental sensemaking, on the one side, safety rules are tools to attract customers and protect the organization against liability, while on the other, the safety rules are instruments to create a safety mindset and achieve safety.

The engineers have a similar sensemaking as the management culture in the external aspect, however, in the internal instrumental sensemaking it was evident that they focus on technical safety provided by national and international standards, rather than safety rules provided by the HSSE department. For the engineers the technical safety rules enable designing safe constructions, while the rules stemming from the HSSE department were more about creating a mindset. Because of this difference, the engineers found the rules from the HSSE department as something that could potentially steal focus away from the issues that really created safe constructions.

The operations culture is the sub-culture that differs the most from the others in that they focus on the day-to-day interactions with action rules. In their sensemaking, they focus on whether the safety rules enables or hinders work. While the two other sub-cultures viewed compliance to the external environment as a necessity to be a player in the oil and gas industry, the operations culture often viewed safety rules stemming from the external environment as a hindrance for effective and safe operations.

As mentioned, with regards to the external instrumental dimension, the management culture have a sensemaking approach that the rules not only function to create safe operations, they also enhance competitiveness, and are created to ensure compliance with the external environment. The more aligned the safety rules are to the clients and external auditors' demands, the better the safety rules function in that aspect. However, the management culture's instrumental sensemaking is in conflict, by blindly complying with the external environment, the rules become more about serving the clients and auditors instead of achieving the safety rules original agenda, which is to assure safe operations. Hale & Borys (2013a) notion of performance rules can help us understand the management culture's sensemaking of the safety rules. As shown in table 2, the management culture is, to a large extent, only exposed to performance rules in their work. Their sensemaking is that the rules and procedures need to be both broad and comprehensive because of regulations from clients and other external sources. However, the management culture's proximity to the actual use of the written rules and procedures is far away from what the operations culture experience in their daily work. Thus, not experiencing the safety rules first hand affects their sensemaking. This is also present amongst the engineers' instrumental sensemaking, which is similar to the management culture in that the safety rules are

not only about achieving safety but also about complying with clients' demands and achieving a competitive advantage.

It seems that the instrumental dimension creates the sensemaking that the engineers are not part of operations in the same way as the operators. Engineers comply with international standards and codes, rather than action rules. Whereas the operations culture members expressed that they try to comply with all the safety rules, and thus experience a constant struggle between rule compliance and practicality, whether or not the rules hinder or enables their work. They are constantly exposed to action rules dictating their behavior, at the same time, they face operations that are constantly changing. However, the operations culture also has an external instrumental sensemaking in that they view the safety rules as created for external clients, thus the demands from the external environment is prioritized rather than safe and effective operations. They are seen as a compliance artifact, not necessarily for their own work tasks, but rather for management to protect them from legal conflict and for the client compliance.

6.2. Symbolic. As became apparent in the findings section, safety rules created both similar and different symbolic associations across the three sub-cultures. A striking feature was the top-down sensemaking. Both the management culture and engineering culture had a positive symbolic sensemaking of the safety rules emerging top-down. Whereas the operations culture saw the safety rules as carrying a negative meaning of being pushed down the hierarchy without consulting with them. Involvement in rule-creation has been proven to be key to managing the gap between the rules and routines (Weichbrodt, 2013). For this to happen, there needs to be a will amongst the rule-creators and supervisors to involve the operators.

Another interesting sensemaking approach is that both the management culture and the engineering culture have a symbolic sensemaking of it being up to the individual to be proactive and update oneself on the safety rules. The safety rules carry a meaning that one needs to be competent and proactive to understand and gain information about them. However, the operations culture had a different symbolic sensemaking of the same emergent theme. They were provided with the rules rather than seeking them, consequently making it not being up to the individual. This symbolic sensemaking could also affect other ways the operators made sense of the safety rules, e.g. the top-down negative symbolic meaning.

The operations culture sensemaking in the symbolic dimension revolved around the bureaucratization of safety rules, and a negative perception of top-down rule-creation and implementation. In their sensemaking, the operations-culture informants were pointing out that the safety rules were lacking practicality; safety rules therefore had a somewhat negative symbolic meaning, associated with bureaucracy and management not understanding what is really happening "on the line." This can create a situation where the safety rules fail to achieve the intended outcome, and that the operators could be less inclined to enact the written rules (Feldman, 2000; Desai, 2010). And, whether or not the operators take action and try to change the rule depends on how they make sense of how rules are created in the organization (Weichbrodt, 2013). What was particularly interesting in this case was that the negative symbolic sensemaking was often directed towards external safety auditors from clients or standardization companies, rather than internal management. One can observe how the management culture's sensemaking in the instrumental dimension (protect firm and get clients) is present as a symbolic dimension sensemaking amongst the operators (bureaucracy). The two dimensions of sensemaking do not exclude each other; rather they exist simultaneously (Rafaeli & Vilnai-Yavetz, 2004).

One particular sensemaking in the symbolic dimension amongst the engineers stood out; the safety rules carried a symbolic meaning of not being part of their core work, not relevant. The safety rules were something not concerning them, but the operators, and something the HSSE department was concerned with. An explanation for this could be that most of the safety rules they are exposed to are created for external compliance rather than usability. As pointed out by Embrey (1999), first the rules must work, and second, they must be acceptable to those using them. This is especially true for the written rules and procedures in the database in the company's intranet. The engineers viewed the safety management system procedures as something stored away on the intranet. Another aspect of the relevance of rules was that many of the engineers expressed that the safety rules (especially office rules) stand in the way of what is really important for them, namely the design of the structures. It hinders rather than enables work. What enables work for them are the technical safety rules. An explanation could be the fact that most of the safety rules in the office are in place to create a safety mindset amongst the engineers, as compared to enable safe operations. This is very similar to the operations culture symbolic sensemaking of bureaucratization of the safety rules. Thus, we again observe how the external environment affects the sensemaking of the safety rules amongst the sub-cultures also in symbolic dimension.

6.3. Gaps and Ownership at Constructor

In the two sections above we have addressed research question 1. We will now address research question 2, by elaborating on the gap present between the safety rules and routines, how the employees in the case organization participate in rule creation, and how this affects psychological ownership.

6.3.1. Compliance gap. As we have argued in the sensemaking section above, the three organizational sub-cultures make sense of the safety rules in different ways. The difference in sensemaking entails a different *routine in principle* amongst the three cultures, which can create a compliance gap between the written safety rules, the artifacts, and the routine in practice. Even though our focus in this paper is on the *routine in principle*, as we did not observe any work in practice, traces of a compliance gap, a gap between the artifacts and the *routine in practice*, emerged during our interviews. Below is an overview of some of the gaps we discovered between the safety rules and the *routine in practice*.

6.3.1.1. Handrail. Holding the handrail while walking the stairs was a well-established rule at Constructor. And, even though most of the people we walked with used the handrail, the participants in our sample indicated that the rule was not always followed.

“It is widely advised to grab the handrail when walking in stairs, but it barely can be seen that somebody follows it.”

6.3.1.2. Observations. Every employee at Constructor is supposed to deliver two observational reports on average each month. These reports should entail a safety moment the employees had experienced and could be positive or negative. When we asked how many they were supposed to deliver each month, few knew that the correct answer was two, and even fewer had submitted two in the previous months.

“We are struggling with this, we have these observational reports we are supposed to fill out. But in this environment, you are sitting on a chair all day while holding a pencil, very little can happen. Are we supposed to report an incident such as: Obs, today I dropped my pencil?”

6.3.1.3. Technical safety. All the Engineers we interviewed that worked with technical safety told us that deviance from rules and procedures was not uncommon. However, they had a rigid change control system in place, and strict procedures on how to handle the gap between the project design and technical safety rules.

“Sometimes with the constraints of the project there are some rules you cannot follow. Then in this case you have to document, ask if you can deviate from these rules and get acceptance for it.”

“It is allowed to deviate, and I have done it. But we have a tool that makes sure that everyone is informed which is called the change control system. When you deviate from the design, project plan or procedure, you have to make a deviation request. This request has to go through a risk evaluation and based on this the deviation will be approved or not.

6.3.1.4. Meta-statements. The participants we interviewed with on-site experiences told stories that indicated gaps between rules and work performed. One of the gaps was between the procedures (meta-statements) the engineers had to write to explain how their design should be built safely.

“I have written this procedure, it is signed and reviewed by my colleagues, so I have done my job. My procedure is there but do you really bother to check if anybody follows the procedure? You can see the results later on, the procedure hasn’t been followed.”

Other participants described situations when others or themselves had broken some of the HSSE rules.

“I can admit that there has been a case with myself. Nearby the structure there was a scaffold directed, very low but high enough to be inside the limits of height restrictions. According to the clients standard a person should be with a harness on heights above 1,2 meters; it is a bit higher then this table! I does not making sense, not that I always would disregard the requirement, but at that moment I had no time to go to the warehouse and pick up a harness. What did I do? I just climbed the scaffold, hoping nobody would see, I saw what I needed to see and left.”

The discovery of a compliance gap at Constructor is not surprising, however, it further strengthens previous research findings that proclaim the dynamic aspect of the rule-routine relationship, and it makes it salient that investigating this topic is important.

6.4. Managing the gap. As discussed in the literature section, the presence of a gap between rules and routines has been identified in different organizations by several researchers before us (e.g.

Feldman, 2003; Wilhelm, 2014), and several factors have been found to affect the relationship. Embrey (1999) indicated in his research that two “best practice” rules were important to follow if one wished to manage the gap. First, the rules must work, and second, they must be acceptable to those using them. The former relates to the instrumentality of the rules, do the workers perceive the rules as artifacts that support them in their daily work? The latter relates to whether or not the employees have been given a voice with regards to rule-creation. The first we discussed in the sensemaking section of this paper, and the second we will discuss now. One of the most prominent factors that affect the management of gaps is rule-followers involvement in the rule-creation, and its role in the development of psychological ownership (Antonsen et al., 2008).

6.5. Psychological ownership and participation. According to Pierce et al. (2001), psychological ownership emerges in three different ways: when participants are able to control the target, when participants get to intimately know the target, and lastly, when the participants are able to invest themselves in the target, or put in other words, are allowed to participate in the rule-creation (Pierce et al., 2001). The last route to psychological ownership has been found to be the most powerful (Pierce et al., 2001), and several researchers have found positive effects of rule-followers participation in rule creation (Bax et al., 1998; Ranney & Nelson, 2004; 2007; Simard & Marchand, 1997). Because of previous research illumination of rule-followers participation importance, we also wished to investigate how the different participants in our sample were involved in the creation of safety rules, and if it created psychological ownership.

As we discussed earlier, the management culture is primarily a rule-creator, while the engineering and operations cultures are primarily rule-followers. In table 2 below one can find an overview of the three different cultures, their dominant role in the rule hierarchy and the themes that emerged during the interviews with regards to their involvement.

Table 2 Sub-cultures participation in rule-creation.

<i>Culture</i>	<i>Role in rule-hierarchy</i>	<i>Themes</i>
Management	Maker	Participation is important Participation is challenging
Engineering	Follower	Invited to participate Not involved
Operations	Follower	Two channels of participation Not involved

6.5.1. Management culture

6.5.1.1. Important. During our interviews, it became apparent that worker involvement in rule creation was important for the management culture, and they were aware of the potential positive effects.

“They are involved in incidents investigation, and through that, rule creation. The investigators interview operators, if the incident is crane related they interview crane operators, they involve line managers and department managers. When they are finished with investigating, they present their findings and recommendations: this is what we have discovered, comments or other viewpoints anyone? We have a formal meeting, then we sign.”

“When we make new rules, when we made Just Rules for example, then we invited the operator's, safety representatives and middle managers into the process”

“Let us take lifting operations as an example: Why did we have so many incidents related to lifting operations? The management does not know, therefore we made a crane forum where we invited workers with lifting operation experience to talk amongst themselves across the different subsidiaries in Constructor. We have to learn from each other across projects. The people involved in the crane forum created specific rules which have been implemented across the corporation.”

6.5.1.2. Challenging. Even though they knew that worker involvement would create positive effects with regards to rule-compliance, the **management** culture found it challenging to invite many workers into the rule-creation process. This was primarily because of the project-based organizational design. In the past, construction was performed on Norwegian soil by permanently employed workers, and they could be invited into the rule-creation process. Today, employees are on temporary contracts and construction projects are located abroad.

“Ten years ago, 80 % of the work force were permanent employees, then we could build stone by stone, then we could involve a lot of different people, but now it is the opposite. 60-70 % of the workers are temporarily hired. Workers from all over the world are working for us in a short time span. If you look at our current project, we go from zero to a hundred in ten seconds, suddenly we have two thousand men on site, only two months ago we didn't even have the contract. That is a challenge!”

The fact that most of the two thousand workers are employed by subcontractors, and not directly with Constructor, also creates challenges. In an attempt to involve the sub-contractors, and enhance their ownership towards the rules and procedures, Constructor wants them and their workers to comply with; they are invited to HSSE summits.

“As a measure to tackle these challenges we have created a HSSE summit. We invite everyone; you can call them decision-makers, which works for the sub-contractors to a summit. There we talk and share knowledge over a period of one and a half day. This is a measure to create stronger ties between the sub-contractors and us.”

6.5.2. Engineering culture

6.5.2.1. Invited to participate. The engineers worked at the office and were aware of the safety rules, however, as the sensemaking section indicated; they did not find the safety rules relevant for their work as they primarily focused on technical safety. Even though they found the safety

rules as not relevant, they felt there was openness in the organization with regards to participation; if they wanted to be involved they could.

“It is quite easy to provide input, there is no doubt. If the input is taken into account I do not know, but we are encouraged to be active in this area (talking about safety rules and procedures).”

”We are strongly encouraged to contribute, Constructor has a high focus when it comes to informing and including everyone when it comes to these subjects (talking about safety rules and procedures)”

6.5.2.2. Not involved. Although the majority of engineers talked about high openness when it came to being involved, they seemed to be little involved in the creation of the safety rules.

“HSSE, personal safety, we are not involved with that, not I at least.”

“I don’t know; I am not involved in developing the HSSE procedures. And I guess it is these safety guys that develop it.”

“I do not have a clear conception of how they are made, I have to admit that, and I know that someone works with it, but I do not know more than that.”

”You have a HSSE department here in the organization, it works a little with its own things and makes procedures. It is mostly because we are supposed to have it and we need to have it but the employees does not always know about the procedures.”

6.5.3. Operations culture

6.5.3.1. Observations. The participants with on-site experience were involved in the rule-creation through two channels. The observational system:

“In Canada hats kept falling from heights, there were no rules telling workers to secure their hard hats; to use either a chin strap or a cord. Workers that were looking down were dropping hats quite frequently. One day I was working under the deck and a hat landed one meter from me. It could have hit me! I reported this near miss and the rule was implemented a few months after that. My case was not enough for the HSSE organization. Probably it is a lot of bureaucracy within some projects that slow down the processes.”

“On the last project we had around 30 eye traumas, probably minor but anyways. The reason was either lack of proper wear or improper goggles. The goggles were very bad, not really applicable to operations. On the project we got glasses that dampened when we entered a space with a different temperature, we could not see anything. This was a space where we should have been very attentive, so people had to remove glasses to see. This is not safe, but people did that because they had no option. There were no other goggles available and everyone was aware of it. We asked people working in the area to write as many reports as they could and talk to HSSE representative in the area. After a short period we got a bunch of new glasses that was acceptable. We talked to foreman and

supervisors, and message from everyone helped to get the HSSE inspectors to order new glasses.”

Or through dialogue with closest supervisor or HSSE representative, although this is described as something that happens rarely and with a varied success rate:

“The rule was discussed, and then we showed the supervisor and HSSE representative. We took them to where the work activity was going to be performed and explained this and that. However this is rare, you don’t mess with safety. It has happened, the supervisors understand the madness, that not all rules are valid in all situations.”

“Quite many rules we managed to change, managed to prove that we also had safe way to perform the operation. It was like fifty-fifty, sometimes we did not waste time, we just dropped the safety discussion, we just followed safety rules; sometimes it is just easier.”

6.5.3.2. Challenging to participate. When the interviewees talked about how they tried to involve themselves in the rule-creation process, they experienced challenges with regards to hierarchy and rules that was beyond Constructor and the projects control because they were imposed by a third party inspector.

Hierarchy:

“It depends what position you have, when a worker talks to the HSSE inspector it is different to when a supervisor is talking to the HSSE inspector. It could be different perceptions, not in Canada, but in Russia it is definitely like that, a hierarchy mindset. In Russia it is a hassle to have constructive communication”

Third party:

“We were told that it was a third party governmental inspection, he said that this is the area for this rule and this is the area for that rules.”

7. Summary and Conclusion

Creation of rules in a pure bottom-up fashion is rare, more common is participation through consultation; where rules are created by managers and workers are invited to comment (Weichbrodt, 2013). Based on our findings, it seemed as Constructor followed this approach when it came to inviting the rule-followers into the creation process. The management culture indicated that they wanted to invite the rule-followers into the process, and most of the safety rules were, in fact, created in collaboration with participants from the operations culture and engineering culture. The challenge for the management culture was that the employees they had involved in the creation of safety rules were not necessarily the workers that were supposed to follow the rules today. So even though the rule-makers involved workers and created ownership among previous employees, little ownership was present in their current workers.

Another challenge for the management culture was that they often were rule-followers themselves. Many of the rules translated and communicated throughout the organization were imposed by external actors such as governments and clients. Yet this often resulted in a communication gap (Rasmussen & Lundell, 2012) where intended signals were often misunderstood or not agreed due to origin. Even if the rule-makers wanted to involve the rule-

followers in the creation process, they could not because of restrictions from the external environment.

The engineering culture felt that they were invited to participate, however, they told us that the safety rules meant for work on-site were not especially relevant for them, as we have shown in the sensemaking section of this paper. This created a situation where they knew they could participate; however, they chose not to, and as an effect, they lacked ownership towards the rules.

The operations culture indicated that they had two main channels to participate in the rule-creation process, the observation system, and through dialogue with their supervisors and HSSE inspectors. Even though they sometimes managed to impact the safety rules, they also have challenges with their participation. Their challenges were connected to hierarchy, and a parallel to the top-down approach found in the sensemaking section could be made. Both the engineering culture and management culture had a positive view of a top-down approach, but this seemed to block the operations possibility to participate. The trend that the creation of rules is becoming more and more separated from operational work (Dekker, 2014) creates a situation where the route to psychological ownership is blocked by increased specialization of labor. The increased bureaucratization of safety has created a situation where the local knowledge of practitioners is marginalized with regards to creating safe work environments (Knudsen, 2009; Almklov et al., 2014).

Another challenge for the operations culture was when they faced rules imposed by external actors, such as clients and governmental HSSE-inspectors. Here they are in the same situation as the management culture, both found it difficult to work with safety rules they had little power to change. The challenges above block the development of ownership towards the safety rules. As Feldman (2000) and Desai (2010) found when they researched the rule-routine relationship, when rule-followers failed to achieve intended outcomes, routine performers might be less inclined to enact the written rules, or may not even have the capacity to comply. This creates a situation where the operations-culture might feel that they cannot change the rules and, therefore, they will create hidden informal routines based on their own experience, and work performed will drift away from the artifacts (Snook, 2002; Dekker, 2011).

8. References

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