Exploring perceptions of job insecurity and safety climate among offshore maritime workers following the 2014 petroleum recession: A two-study design

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Abstract

The purpose of the master thesis was to examine safety climate and job insecurity perceptions in the Norwegian petroleum industry in light of the 2014 oil crisis, using a two-study design. Study 1 consisted of four interviews with health, safety, environment and quality managers from Norwegian shipping companies who had ongoing contracts with a major Norwegian hydrocarbon producing company. The results from Study 1 indicated that the safety focus had improved between 2013, 2015 and 2017. The informants experienced low job insecurity, but reported higher job insecurity for maritime workers and other employees. Study 2 included three extensive surveys that were collected in 2013, 2015 and 2017, in which the respondents were maritime workers on offshore vessels. The results indicated that the maritime workers' perceptions of job insecurity increased from 2013 to 2017, while perceptions of overall safety climate did not differ across the three time points. A small improvement in workers' perceptions of safety climate specific to the shipping company level was found from 2013 to 2017. Overall, the shipping companies demonstrated that their safety systems were resilient, which contributed to upholding the safety climate among offshore maritime workers following the 2014 oil recession, although the workers were more worried about losing their job after the crisis. To our knowledge, this is the first study to investigate whether the oil crisis in 2014 was related to changes in offshore maritime workers' perceptions of job insecurity and safety climate.

Keywords: Safety climate, Job insecurity, Recession, Petroleum industry, Maritime workers.

Word count: 19 417

Sammendrag

Formålet med denne masteroppgaven var å undersøke opplevelsen av sikkerhetsklima og jobbusikkerhet i den norske petroleumsindustrien i lys av oljekrisen i 2014, ved bruk av et to-studiedesign. Studie 1 bestod av fire intervjuer med helse, miljø, sikkerhet og kvalitetsledere fra norske rederier som hadde pågående kontrakter med et stort norsk oljeselskap. Resultatene fra studie 1 indikerte at sikkerhetsfokuset hos rederiene hadde økt mellom 2013, 2015 og 2017. Informantene opplevde lav grad av jobbusikkerhet under nedgangstidene, men fortalte om høyere grad av jobbusikkerhet blant skipsarbeiderne og andre i rederiet. I studie 2 analyserte vi tre store spørreundersøkelser fra 2013, 2015 og 2017, hvor respondentene var skipsarbeidere fra offshore-fartøy. Funnene fra studie 2 indikerte at skipsarbeidernes opplevelse av jobbusikkerhet økte fra 2013 til 2017, mens arbeidernes samlede opplevelse av sikkerhetsklima holdt seg stabilt på tvers av måletidspunktene. Det ble funnet en liten forbedring fra 2013 til 2017 i skipsarbeidernes opplevelse av sikkerhetsklima spesifikt for rederiet. Samlet tyder resultatene på at rederiene hadde robuste sikkerhetssystemer som bidro til å opprettholde sikkerhetsklimaet blant skipsarbeiderne på offshore-båter under og etter oljekrisen i 2014, selv om arbeiderne var mer bekymret for å miste jobben etter krisen. Dette er, så vidt vi vet, den første studien som undersøker hvorvidt oljekrisen i 2014 var relatert til endringer i opplevelsen av jobbusikkerhet og sikkerhetsklima blant offshore skipsarbeidere.

Nøkkelord: Sikkerhetsklima, Jobbusikkerhet, Nedgangstider, Petroleumsindustri, Skipsarbeidere.

Preface

The idea for the master thesis was developed after a meeting with Associate Professor Bjørn Sætrevik in the Spring 2017. We learned about the ongoing collaboration between Statoil and the University of Bergen and thought it would be interesting to analyze the data in light of the recent economic downturn in the petroleum industry. We combined the quantitative surveys with interviews with HSEQ-managers in Norwegian shipping companies, which we analyzed qualitatively using a template analysis. Statistical analyses of the surveys were done independently after formalizing the hypotheses in February 2018.

We want to thank Associate Professor Bjørn Sætrevik for making the master thesis a possibility. We are greatly appreciative that he allowed us to utilize data from a ongoing project and were given the opportunity to collect data from four shipping companies.

We are grateful to our supervisor Professor Jarle Eid for guiding us safely through the various stages of the thesis. His expertise for this field has motivated and encouraged us throughout this process and we have greatly benefited from his feedback.

We would like to thank the HSEQ-managers who kindly agreed to take part in this master thesis. We are truly appreciative to have had the opportunity to meet and listen to their thoughts on safety matters. Moreover, we have gained much insight on safety topics thanks to them.

We would also like to thank the respondents who participated in the 2013, 2015 and 2017 surveys; Kjersti Bergheim Valdersnes for letting us practice our interviews skills with her; Marit Davidsen for introducing us to the HSEQ-managers and the University of Bergen for founding our travels to the shipping companies.

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Aim

In 2014, the Norwegian petroleum industry faced a major economic recession and subsequent decline in profit margins. In the years following the recession, the Norwegian media reported that the recession had been accompanied by a heightened job insecurity among employees in petroleum related industries (NTB, 2017). Job insecurity is linked to many negative outcomes, such as increases in occupational injuries and accidents (Probst & Brubaker, 2001). However, few studies have systematically explored whether job insecurity perceptions among employees in petroleum-related industries in Norway changed following the 2014 recession. Likewise, the potential impact of the major 2014 recession on safety practices and perceptions in the petroleum related industries remains an empirically underexplored topic to date. In 2016, the Petroleum Safety Authority in Norway expressed concern about the cost-cutting measures initiated by Norwegian oil companies following the recession (Sundberg, 2016). More specifically, they were worried that safety would be affected by the extensive cost-cutting and downsizing, and thus warned that safety is an area that should be prioritized no matter the economic circumstances. A recent report from the Petroleum Safety Authority demonstrated a decrease in major accidents from 2015 to 2017, however, it also reported an increase in severe injuries among workers and that the work environment, health and safety climate, and risk perceptions had worsened (Petroleumstilsynet, 2018). Previous research has indicated that worker perceptions of a favorable safety climate are consistently linked to favorable safety outcomes (Christian, Bradley, Wallace, & Burke, 2009; Hetherington, Flin, & Mearns, 2006; Nahrgang, Morgeson, & Hofmann, 2011, 2007). However, few studies have examined how workers' perceptions of safety may be affected over time by macro-economic trends, and in particular by a need to reduce costs and to increase profit margins in a volatile business such as the petroleum industry. Furthermore, a recession may complicate safety issues despite comprehensive safety

legislation and regulations. It is important to investigate workers' perceptions of safety since the petroleum industry is a high-risk industry where a major accident would have significant detrimental effects on not only the people, property and environment, but also on other important industries for Norway such as the tourism and fishing industry. The aim of the present master thesis was therefore to examine whether perceptions of job insecurity and safety climate among workers on offshore vessels on contract with a major petroleum company changed following the 2014 recession in the Norwegian petroleum industry.

We applied a mixed methods strategy to explore this issue, where we first conducted a series of interviews with subject matter experts on health, safety, environment and quality (HSEQ) in ship-owning companies servicing the offshore energy industry. The interviews were conducted to establish an overview of how the companies had coped with the recession and provided a background for specific hypotheses on job insecurity and safety perceptions to be examined in the quantitative data. In the following phase, we analyzed three cohorts of survey data (2013, 2015 and 2017) from workers on offshore vessels servicing the petroleum industry, in order to test the hypotheses derived from the interviews with the subject matter experts.

In the first section we will present an overview of how the petroleum industry is related to the Norwegian economy. This will be followed by a description of how a recession may affect job insecurity perceptions and contribute to downsizing processes. Next, we will introduce which international safety legislation the petroleum industry has to follow. Subsequently, we will review various safety perspectives, organizational and human factors, the Swiss Cheese Model and safety barriers. Moreover, we will examine workplace safety issues and how the safety climate can be used to understand organizations' safety-related behavior and attitudes. We will then focus on how the safety climate in an organization might be affected by a downturn in the industry. We will also illustrate how a resource-constrained

organization may weaken the workplace safety and safety climate. Finally, we will investigate how a recession can impact safety and health outcomes.

General introduction

A brief overview of the Norwegian petroleum industry and economy

The petroleum industry has since the discovery of oil in the Ekofisk field in 1969 grown to become Norway's most profitable and largest industry when measured in economic growth, state's income, investments, and export value (OED, 2017). Furthermore, the industry has been a tremendously important contributor to the Norwegian welfare state, and has provided the country with wealth, economic stability, and growth for the last decades. However, this also means that the country's economy may be vulnerable to fluctuations in the international petroleum marked. Consequently, if the petroleum industry is negatively affected, this may have detrimental effects on the state's economy. Such a negative shift in the petroleum industry occurred in September 2014 to January 2016, when oil prices dropped from an average of 100 USD down to scarcely 30 USD per barrel (SSB, 2016). This period is commonly referred to as the 2014 oil crisis and resulted in a downturn for the Norwegian economy. In late 2014, the severity of the situation became clear and the industry implemented a multitude of cost-cutting measures. As as result, many lost their jobs. To illustrate, approximately 232 100 people were employed in the petroleum industry (directly; operator companies and suppliers) or petroleum related-industries (indirectly; suppliers of transport, goods and finances) in 2013, which was almost 1 of 10 of all employed in Norway (Hungnes, 2017). Recent estimates reveal that during a three-year period from 2013 to 2016, nearly 1 out of 4 of those who were working in the petroleum industry and petroleum related-industries in Norway lost their jobs. Following the 2014 downturn, the economy in Norway has been characterized by low revenue growth, layoffs and increased unemployment

(Finansdepartementet, 2017). This demonstrates that a Norwegian economy without a strong petroleum industry suffers profoundly. Overall, the dramatic decline of oil prices initiated major setbacks for the Norwegian economy.

The recession has triggered ripple effects in the industry, society and economy. Thus, in the following, we will attempt to understand how the recession may be related to the perception of safety and job insecurity of offshore maritime workers in the petroleum industry.

Recession, downsizing and job insecurity

A drastic decline in number of applicants to educational programs may be a sign that an industry is moving towards a state of recession or being in severe financial difficulties. Studying petroleum-related degree programs was for many years seen as a secure way of obtaining a job, as the industry in Norway experienced a "golden age" with high wages and promising career opportunities. However, as a probable consequence of the recession, petroleum-related educational programs experienced a drastic decrease in number of applicants of approximately 85% from 2013 to 2017 (Lynum & Dons, 2017). The major drop in applicants indicates that the petroleum industry is perceived as less lucrative and could account for an increase in job insecurity perceptions over the years, for both the remaining workers and newly educated students. De Witte (2005) argued that job opportunities in the labor market are often a good indicator of the economic climate, and that job insecurity perceptions are related to the existing prospects in the labor market.

An increase in job insecurity is often an inevitable consequence when an industry experiences a recession. Job insecurity reflects an individual's worry or fear about losing their current job (Sverke, Hellgren, & Näswall, 2002). This definition refers to quantitative job insecurity, as it concerns "worries about losing the job itself" (Sverke & Hellgren, 2002, p. 30). Qualitative job insecurity, on the other hand, entails a worry of losing specific features of

the job (Shoss, 2017; Sverke & Hellgren, 2002). In the present thesis, we refer to the quantitative aspect of job insecurity unless otherwise noted. Our focus is therefore on job loss insecurity rather than job feature insecurity (Lee, Huang, & Ashford, 2018), which is in line with the majority of the existing job insecurity literature.

Job insecurity is a subjective perception (De Witte, 2005), which can make a individual experience a highly uncomfortable feeling and a state of powerlessness. For instance, personality and individual unemployment experiences in the past have shown to influence how secure a person feels in their current job (Lübke & Erlinghagen, 2014). Given the subjective nature of job insecurity, people may feel insecure even if their job is objectively secure and vice versa, for instance due to poor communication from the management (Burchell, 1999). Furthermore, as it is a subjective experience within the individual it makes sense to refer to perceptions of job insecurity.

Unlike other types of work stressors like conflict and time pressure, job insecurity serves as a constant stressor that cannot be resolved (Lee et al., 2018). A study by Dekker and Schaufeli (1995) found that being in a prolonged insecure job situation had more detrimental effects on a worker's psychological health than knowing for certain that one would lose their job.

Perceptions of job insecurity may therefore be a major source of stress, and research demonstrates that it can negatively affect the workplace safety. Probst and Brubaker (2001) found that employees who reported high levels of job insecurity perceptions were more involved with workplace injuries and accidents than workers who reported low job insecurity. Furthermore, the study indicated that workers who experienced high job insecurity perceptions exhibited less safety knowledge, safety motivation and compliance with safety policies.

An organization needs projects and contracts to maintain the size of the workforce. If a company goes too long without contracts, the workforce will become a liability. Workers is a vast expense for an organization and management will often begin downsizing processes in order to prevent or diminish economic losses. Downsizing is a common reaction when an industry is going through a recession. Downsizing is defined as "the process in which an organization reduces the size of its workforce through a variety of processes, including voluntary and enforced redundancy, closure of worksites, and outsourcing activities" (Quinlan & Bohle, 2009, p. 3). The company's downsizing processes are often done in rounds, as they constantly evaluate how many employees they need, depending on their number of contracts.

Research has demonstrated a range of factors and conditions that can affect job insecurity perceptions. For instance, a personality variable termed negative affectivity may affect job insecurity perceptions, in the case of workers having a negative perspective on the job prospects in the industry (De Witte, 2005). Other likely factors include national levels of unemployment, the workers' educational level, type of work and employment relationship (temporary or permanent employment) (Anderson & Pontusson, 2007; De Witte, 2005; Erlinghagen, 2008; Näswall & De Witte, 2003). A model by Sverke and Hellgren (2002) elucidates several factors that contributes to job insecurity perceptions. The model separates the antecedents of job insecurity in subjective characteristics (perceived employability, perceived control, family responsibility and a need for security) and objective characteristics (characteristics of the labor market, organizational change and an uncertain future for the organization). Similarly, findings by Ashford, Lee, and Bobko (1989) illustrate that three factors can lead to a lack of control for the individual and therefore job insecurity. These were organizational change, role ambiguity (uncertainty about job requirements and procedures) and locus of control (internal or external). Moreover, studies have also focused on internal and external determinants of job insecurity. Lübke and Erlinghagen (2014) propose two

strands of determinants of self-perceived job insecurity; one which focuses on individual characteristics like age, gender, health and education, and one on country-specific context like labor market characteristics, unemployment rate and welfare-state institutions. A common feature throughout is that the economic climate in the industry and country can impact people's job insecurity. However, it is important to remember the subjectivity component in job insecurity perceptions and that a recession does not automatically lead to job insecurity (Burchell, 1999; Erlinghagen, 2008; Mau, Mewes, & Schöneck, 2012).

Schein (1970) suggested that a psychological contract, which states what each party will receive and give, is formed between the employee and their employer when a working relationship begins. This will give the individual a sense of mastery because they know what is expected of them and what they will receive in return. However, job insecurity may threaten to dissolve this sense of mastery if the industry experiences an economic decline (Ashford et al., 1989). In contrast to psychological contract theory, others propose a justice perspective on job insecurity. Here job insecurity is perceived as an unjust feeling because the workers feel they receive less rewards in comparison to how much effort they put into work (Shoss, 2017).

International safety legislation in the petroleum industry

Probst and Brubaker (2001) highlighted that job insecurity might affect safety in a negative manner. This is particularly worrying for the maritime industry, as maritime workers already have one of the most hazardous occupations in the world (Håvold & Nesset, 2009). Roberts (2002) demonstrated that British maritime workers were 26.2 times more likely to have a fatal accident at work compared with other British workers. Maritime workers in the oil and gas industry are especially exposed to accidents and dangers, as the industry combines threats from both the industrial and the marine environment (Mearns & Flin, 1995). Marine and industrial hazards include uncontrolled blowouts from petroleum wells, exposure to toxic

substances, explosions and fire, structural weakness to the installations, dangers associated with underwater operations and diving, and accidents related to transportation of staff and supplies (ILO, 1993; Mearns & Flin, 1995). Furthermore, uncontrollable weather conditions may complicate standard day-to-day operations and rescue missions. Altogether, the prospects of catastrophic outcomes serve as a continuous threat for the installations, the environment and the people involved.

International safety legislation is fundamental for keeping people, environment and property free from harm and to ensure safe operations in petroleum and maritime industries. Laws and regulations also exist to make sure maritime workers are provided with the best possible prospects during and after their working life has ended. Measures to improve the safety in marine operations date back to the foundation of the International Maritime Organization in 1948. The International Maritime Organization was established as an international "authority for the safety, security and environmental performance of international shipping" (IMO, 2018a). Moreover, the International Maritime Organization has further been developed into a universal regulatory framework for the international shipping industry, wherein Norway is currently one of 172 members. The major maritime accidents during the 90s contributed to the implementation of the International Safety Management (ISM) Code in 1998 (Nielsen, Eid, Hystad, Sætrevik, & Saus, 2013). The International Safety Management code intends to be a global standard for safe operations and management on marine vessels and prevent excessive pollution from ships (IMO, 2018b).

Creating new guidelines to strengthen and improve the safety of peoples' workplace conditions on offshore vessels and operations is a continuous process. For example, the United Kingdom presented the Guidelines for Offshore Marine Operations (G-OMO code) in 2013, as an international approach designed to promote high standards for safety practice and operations on offshore vessels in the petroleum industry (G-OMO, 2013). The G-OMO code

was implemented the following year in Norway. However, accidents still occur despite comprehensive legislations and safety regulations. For instance, the Deepwater Horizon oil spill in 2010 serves as an example of an accident where both people, environment and property were severely harmed. A drill rig exploded, which consequently led to vast amounts of oil spills into the ocean and extensive damages to the environment. Furthermore, the explosion claimed 11 deaths and injured 17 people who worked at the installation (Levy & Gopalakrishnan, 2010). The importance of error management becomes evident when catastrophes of this magnitude occur.

Organizational and human factors

Error can be understood as some form of deviation from intention. Reason (1995, p. 81) has defined error as the "failure of planned actions to achieve their desired goal". Historically, it was thought that error occurred because of faulty individuals who made mistakes, and thus they were singled out as the origin for error (Woods, Johannesen, Cook, & Sarter, 1994). Contrary to the traditional person approach, an alternative view to why error arises was presented and termed the system approach. The system approach claims that human error is a symptom of problems within the organization (Dekker, 2001). Despite numerous accidents, the petroleum industry's safety successes are much greater than its safety failures, due to the implementation of error management programs.

The aim of error management is to limit incidences where dangerous error occurs, devise systems suited to managing errors, and contain any harmful effects that may arise (Reason, 2000). Effective safety systems are sought after in organizations where workers are exposed to hazardous operations and adverse events. High reliability organizations have the ability to "withstand its operational dangers and yet still achieve its objectives", by developing resilient systems in order to limit, tolerate and contain the effects of errors (Reason, 2000, p. 770). In other words, they are supposed to avoid errors that have severe

consequences, as well as be able to cover demands and production targets (LaPorte & Consolini, 1991). The petroleum industry can be classified as a high reliability organization based on several characteristics, with the perhaps most distinctive one being the amount of time and resources devoted to detecting weaknesses in the system and antecedents of potential errors. An advantage with high reliability organizations is their flexibility in shifting control to the person on the spot when the situation becomes critical, despite being organized in a hierarchical manner (Reason, 2000). Humans are especially important safety components in high reliability organizations as they can generate solutions to unexpected problems, and the human variability is therefore regarded as the most valuable safety barrier against errors and accidents (Reason, 2000).

According to Weick (1987, p. 118), reliability is a "dynamic non-event". Reliability is dynamic because humans create and maintain an environment where they continuously adjust their actions in order to produce successful and stable outcomes. Although continuous adjustments are made, the outcomes are characterized by static non-events that do not attract attention, paradoxically rendering reliability invisible (Weick, 1987). The characteristics of high reliability organizations were originally identified in three kinds of organizations; nuclear power plants, air traffic control centers and US navy nuclear aircraft carriers (Reason, 2000; Weick, 1987). These organizations had different core tasks and objectives but faced similar challenges in terms of operating complex technology with considerable damage potential and maintaining effectiveness and high performance under time pressure. Importantly, they had long-term success in facing these challenges without incurring any major accidents. High reliability organizations provide workers with extensive training programs on a regular basis. These training programs can be both practical and theoretical, and are essential in learning how to avoid, detect and repair errors.

The Swiss cheese model and safety barriers

High reliability organizations commonly apply the principle of system defenses by building safety barriers in order to prevent error or to diminish the effects of errors (Reason, 2000). The hazardous nature of the offshore vessels means that there's a constant demand for defenses, safeguards and safety barriers. A safety barrier can be understood as "physical and/or non-physical means planned to prevent, control, or mitigate undesired events or accidents" (Sklet, 2006, p. 496). The usage of safety barriers originates from the system approach, which states that "humans are fallible and errors are to be expected, even in the best organizations" (Reason, 2000, p. 768). Based on the premise of human fallibility, the system approach explains how human error is a consequence of the "conditions under which humans work", rather than humans being a root cause of errors (Reason, 2000, p. 768). Reason (1990) introduced the Swiss cheese model to demonstrate the principles of safety barriers. The model figuratively illustrates how different layers of barriers contribute to the prevention of harm to humans and property, recognizing that barriers are likely to fail at some point, and that relying on a single barrier to maintain safety is insufficient. The slices of cheese filled with holes are a metaphor for safety barriers, and, unlike actual cheese, the holes rotate and change location continuously. An example of a barrier can be mandatory safety procedures when performing a work task or training the crew to stop work tasks if it threatens the safety, even if it jeopardizes the vessels' progress and the organizations' financial gains. This type of accident prevention means that even though one barrier fails, this will not cause sufficient damage to make an accident occur. However, the dynamic nature of a situation may allow for several barriers to fail, thus causing safety problems. More specifically, this happens when "holes in many layers momentarily line up to permit a trajectory of accident opportunity" (Reason, 2000, p. 769). The existence of holes in the safety barriers is a result of active failures and latent conditions, and negative events often involves both (Reason, 2000).

People commit active failures when they are in direct contact with the system. Active failures is mainly direct, short-lived and can take different forms, largely depending on whether the failure arises from cognitive deficits or informational problems, for instance inattention or forgetting (slips, lapses, mistakes) or if someone deliberately violates a safety procedure (Reason, 1995, 2000). A person often experiences a lapse or slip if they fail to execute a task correctly due to memory or attention failures. Mistakes are failures of intention, which means that a plan was inadequate in the stages of planning or problem-solving, thus people fail to reach the desired outcome (Reason, 1995). By improving the information transmission, one can expect to reduce the number of errors in the workplace. Deliberate safety violations differ somewhat from errors by being the result of intentional deviant behavior. This type of failure is typically associated with motivational problems, caused by factors such as lack of sanctions for violations and lack of rewards for compliance, for example by making a shortcut if the situation allows for it (Reason, 1995). Acts of violations can be affected and regulated by the social workplace environment, and thus handled by providing various organizational and motivational solutions (Reason, 1995).

Latent conditions have been described as “resident pathogens” and can be introduced into the system by decision makers on all levels of the organization; top-level, middle-level and low-level management (Reason, 2000). For instance, by the executive director (top), managers in charge of the building process and design (middle) and builders and supervisors on site (low). Latent failures disrupt and infect the whole system with pathogens, and unlike the immediate effects of active failures, latent conditions can survive unnoticed for a long time before being discovered (Reason, 1995). Latent conditions can have damaging effects by creating work environments wherein errors are more likely to occur, for instance pressure the workers to intentionally breach safety protocols or not having enough staff on duty. Moreover, creating inadequate safety barriers in a case of construction defects, which can

increase the likelihood for mishaps and accidents. Latent conditions are easier to identify and repair than active failures, and thus allow for proactive risk management (Reason, 2000). In conclusion, laws and regulations can minimize the likelihood of errors and accidents, however, failures cannot be entirely eliminated (Rundmo, 1996). The question organizations have to ask themselves is how the system failed, rather than who is to blame when errors happen (Reason, 2000).

The concept of safety is seldom defined in organizational research. Acknowledging this lack of definition, Beus, McCord and Zohar (2016, p. 353) defined workplace safety as "an attribute of work systems reflecting the (low) likelihood of physical harm - whether immediate or delayed - to persons, property, or the environment during the performance of work". The definition is largely based on research done on high reliability organizations. The occurrence of accidents has traditionally been examined as an indicator of workplace safety (Wallace, Paul, Landis, & Vodanovich, 2012). Accidents can be characterized as workplace events that inflict physical damage on humans, property and environment (Casey, Griffin, Flatau Harrison, & Neal, 2017). Beus et al. (2016) further argued that accidents are inefficient as safety indicators, as accidents merely indicate an absence of safety. A lack of accidents does not equal a presence of safety. For instance, a worker may consistently disregard safety protocols, and as long as the unsafe behavior does not trigger an accident, the safety may appear satisfactory. When an accident actually does occur, it is often due to a multitude of factors, for example if workers commit mistakes (active failures) or if the workforce is understaffed (latent conditions) (Reason, 1990).

Safety-related behaviors are more useful as workplace safety indicators as they give information about the absence of safety before an adverse event arises (Beus et al., 2016). Safety-related behaviors are defined as "workplace behaviors that affect the extent to which individuals or the workplace in general are free from physical threat or harm" (Beus, Dhanani,

& McCord, 2015, p. 482). Unlike accidents, safety-related behaviors can provide information on both the presence and absence of safety in a workplace setting. For instance, by observing if workers exhibit safe work-related behavior (safety compliance) or unsafe work-related behaviors. Unsafe work-related behavior can be unintentional, as in the case of forgetting or making mistakes, but it can also be intentional, for example by committing procedure breaches. Despite the fact that accidents only provide information after the damage has been done, they still prove to be a valuable source of information and give insight on workplace safety issues.

Safety entails more than avoiding errors and accidents. Workers create safety through their thoughts and actions, in which others can observe and learn from. Moreover, workers as a team can establish a common and shared understanding of what are appropriate safety attitudes and behavior in the workplace. Safety climate contributes to a comprehensive understanding of organizations' safety behavior and attitudes. Beus et al. (2016) presented an integrated model of workplace safety (ISM), which provides a conceptual framework and summary of current research on workplace safety. The model gives an overview of distal and proximal antecedents of safety-related behaviors and subsequent accidents. One of the antecedents is safety climate. Thereby, safety climate can help elucidate why workers' attitudes and behavior in the workplace are an important safety barrier, and thus demonstrates that research should focus more on how to strengthen humans in their role as safety barriers in times of economic instability.

Safety climate and safety outcomes

Safety climate derives from the climate concept, which is defined as "perceptions of the events, practices, and procedures and the kinds of behaviors that get rewarded, supported, and expected in a setting" (Schneider, 1990, p. 384). Research has shown that the climate of an organization can have an impact on employees' performance, behavior and attitudes (S. P.

Brown & Leigh, 1996; Neal, Griffin, & Hart, 2000; Ostroff, 1993). Moreover, research also demonstrates that there are different types of climates in a workplace setting besides safety, for instance, service and achievement (Schneider & Reichers, 1983).

Inspired by Schneider, Zohar (1980) introduced the concept of safety climate and defined it as a type of organizational climate. The concept consists of "shared perceptions with regard to safety policies, procedures, and practices" (Zohar, 2011, p. 143). Furthermore, Zohar (1980) conducted a literature review to find characteristics that differentiate high and low accident-rate companies. A noteworthy finding was that low-accident rate companies were characterized by a strong management commitment to safety. The management in these companies prioritized safety within the workplace and emphasized a system approach to human error by regarding accidents as symptoms of disease in the system, and thus giving safety officers a high status. In addition, the companies emphasized strongly on safety training, open communication links and frequent contact between workers and management, general environmental control, frequent and routine safety inspections of equipment and the workplace, and a stable workforce with less turnover and older workers (Zohar, 1980). Furthermore, an important characteristic of the companies was that they promoted safety through guidance and counseling.

Zohar (1980) used these characteristics to develop dimensions of a safety climate scale. The eight dimensions were 1) perceived management attitudes towards safety, 2) perceived effects of safe conduct on promotion, 3) perceived effects of safe conduct on social status, 4) perceived status of safety officer, 5) perceived importance of safety training programs, 6) perceived level of risk at the workplace, 7) perceived effects of required work pace on safety, and 8) perceived status of safety committee. These eight dimensions were developed further to make up a 40-item questionnaire which were tested on a sample of 20 industrial organizations in Israel. The two most influential dimensions were perceived

relevance of safety to job behavior and the perceived management attitude toward safety. Zohar (1980) concluded that safety climate was a characteristic of industrial organizations and that it reflects the general safety levels in these organizations. The findings in the study supported safety climate as a validated measurable concept.

There is some disagreement as to which dimensions to include when measuring safety climate (Griffin & Neal, 2000). Brown and Holmes (1986) found three factors and Dedobbeleer and Béland (1991) found two factors when they used a reduced version of Zohar's (1980) measure, while others have used other measurement instruments (Niskanen, 1994) and obtained differing results. A challenge in the safety literature is the many different definitions and use of theoretical concepts, where some have used safety climate and safety culture interchangeably, while others stress the importance of separating the two concepts (Guldenmund, 2000). While safety climate consists of the attitudes to safety in an organization, safety culture is the construct underlying all the attitudes of the organization (Guldenmund, 2000). Safety culture entails the shared values of an organization and contributes to producing behavioral norms (Reason, 1998). These values are expressed through the organizational climate. An organization's safety climate is more dynamic, and therefore easier to change than the culture (Casey et al., 2017). The safety climate can be modified by implementing new programs and policies, introducing regulations and training of the employees. Despite the disagreement on different measurement scales, safety climate continues to exist as a coherent concept (Zohar, 2010).

Zohar (2010) propose that the objective with safety climate is to sort out which kinds of behaviors that are expected, rewarded and supported through signals and patterns the organization endorse with regard to safety policies, practices and procedures. However, it can be challenging due to competing domains and the complexity of the organizational environment. The organizations' safety climate is created by all the employees, including the

management who sets policies and procedures. Zohar (2000, p. 588) further argue that the safety climate perceptions can be understood as "procedures-as-patterns", in the sense that workers develop a understanding of the "relative priority of safety" and thus are less focused on individual procedures. The workers can therefore compare this pattern to the companies' competing domains, for instance safety versus efficiency or productivity goals. If companies fail to prioritize safety repeatedly across situations, workers may interpret this as safety is inferior to the competing goals, which may weaken the safety climate and prompt workers to adjust their safety-related behavior in accordance with the low safety priority (Zohar, 2000, 2010). In conclusion, how an organization manages a recession can greatly impact the safety climate pattern.

A range of studies have investigated the relationship between safety climate, safety behavior and accidents, and thus established safety climate as a leading predictor of safety outcomes (Casey et al., 2017). Christian et al. (2009) found that safety knowledge and safety motivation mediated the relationship between safety climate and safety behavior. In addition, safety behavior mediated the relationship between safety climate and accidents. In other words, promoting a positive safety climate facilitates safety knowledge and safety motivation. Similarly, a work environment with a strong safety climate has been shown to have a positive correlation with positive safety behavior, and a negative correlation with accidents (Nahrgang et al., 2007).

Nahrgang et al. (2011) studied the relationship between job demands and resources, and burnout, engagement, and safety outcomes in the workplace. In the meta-analysis they found that safety climate was negatively related to burnout. Burnout is characterized by exhaustion, cynicism and lack of efficacy at work, and workers suffering from burnout are thought to be at higher risk for committing mistakes (Maslach & Leiter, 1997; Nahrgang et al., 2011; Siu, Phillips, & Leung, 2004). Fogarty (2005) found that psychological strain

mediated the link between safety climate and errors. However, Rundmo (1992) found that strain increased the probability of injuries. The study also demonstrated a negative relationship between job satisfaction and number of injuries experienced, which means that there were less accidents if the workers were satisfied with the workplace safety.

A meta-analysis by Clarke (2006) found a positive relationship between safety climate and safety participation. It is suggested that a positive safety climate encourages safety behavior not only through adherence to rules and regulations, but also through the norm of reciprocity. The norm of reciprocity states that "we should return help to those who have helped us" (Myers, 2012, p. 387). If employees perceive that the management at their workplace is concerned with safety and their well-being, they will reciprocate by engaging in safety-related activities (Clarke, 2006). Clarke (2010) further established the relationship between safety climate and safety behavior, based on findings that the relationship was mediated by work-related attitudes, while the relationship between safety climate and occupational accidents was partially mediated by safety behavior and general health.

There seems to be many factors that contribute to a high-quality safety climate in an organization. Moreover, the fact that the industry is affiliated with a great deal of hazard demonstrates the relevance of elucidating the mechanisms and processes in maintaining a healthy safety climate in a harsh economic environment. However, few studies have addressed how an industry's economic state can affect safety related outcomes and priorities in organizations.

Safety challenges in a resource-constrained system

All decisions create opportunities for active failures and latent conditions to be incorporated within the system. Moreover, the decisions made during a recession might pose a risk to the safety systems as organizations experience a pressure to prioritize efficiency, profit and short gains over safe operations. The balance between safety, production goals and

economic growth can be a dilemma for organizations (Mearns, Whitaker, & Flin, 2003). Furthermore, the dilemma might be amplified when an organization experiences a recession. Dekker (2001) claims that pursuing multiple goals is a major safety threat within resource-constrained systems. In the same manner, Reason (1990) emphasizes that an organization which is governed by short-term thinking, for instance as a result of a financially difficult situation, will be less prone to invest in safety. Therefore, it is possible that an organization's pressure for production and profit can affect the actual safety and the workers' subjective experience of safety. In the case of shipping companies that work in a spot market, they might experience more production-pressure, which can contribute to a lower safety focus than in companies that are on long-lasting contracts. Spot market means that a commodity is delivered immediately ("Spot market," 2010). Human error is always dependent on the organizational and operational environment (Dekker, 2001). Experiencing long-term financial struggles, as in the case of the recession in the petroleum industry, may cause companies to initiate major budget reductions and restructuring of the organization, for instance hiring less expensive suppliers, lay off workers, reduce safety training or not purchasing new work equipment. The process of enhancing the structural effectiveness of an organization to compensate for the lack of profit, could therefore inflict damage to the established safety barriers. For instance, layoffs and budget restrictions might damage safety barriers on offshore vessels by creating a workplace that is understaffed and overworked, which can affect the workers' perceptions of safe operations and increase the probability for accidents. Further, if an organization is in a difficult economic situation it may impair the workers' safety barriers, like a management that pushes the workers to ignore certain safety protocols in order to get the job done faster. In sum, a strained financial situation may construct conditions where active failures and latent conditions can be incorporated into the system.

Furthermore, it may also compromise safety measures and time spent on detecting safety weaknesses, and thus lay the foundation for human errors to be activated.

Recession and safety outcomes

Hofmann, Jacobs and Landy (1995) conducted a review which supported the findings by Zohar (1980), and demonstrated that the management's commitment to safety was an important factor for maintaining a healthy safety climate during a recession. The review illustrated that if the management was not committed to safety issues then it affected the workers' appraisal of the importance of workplace safety. Furthermore, it was deemed crucial that the management conveyed in words and actions that the workplace safety was a priority no matter the economic state.

Bateman (2009) viewed the downturn that occurred in the international shipping industry after the global recession and which implications this had for safety. The author argued that the financial crisis had direct consequences for safety. Direct threats to safety included fewer employees and an increase in number of ships that are laid up, which makes them vulnerable to threats like robberies and collisions. Moreover, an economic decline could also lead to the possibility that some ship-owners feel pressured to take shortcuts when it comes to safety in order to save money. Similarly, Schneider, Hanges, Smith and Salvaggio (2003) found that workers were more satisfied with the security when the company achieved economic success.

McDermott & Hayes (2016) claimed that the economic pressure from the financial crisis led to changes in employment relations in the case of outsourcing jobs to other companies and management of large and complex subcontracting chains. Overall, this can weaken the regulatory oversight and create hazardous work practices by contractors as they try to cut costs due to economic pressure (Quinlan, Hampson, & Gregson, 2013).

Madsen (2013) investigated the profitability-safety relationship in aviation companies and found that if a high-reliability organization such as the aviation industry expect to break-even on profit targets, then they are more inclined to take safety risks compared to companies anticipating high or low profit targets. Interestingly, the study illustrates that the relationship between profit and safety risks is not linear and could thus explain the inconclusive findings on safety and profit issues.

Sønderstrup-Andersen & Bach (2017) propose two different mechanism that takes place in safety activities in a recession. The first mechanism is a counter-cyclical effect, which means that the recession leads to an increase in safety problems due to the stress caused by redundancy processes. The second mechanism proposed is a pro-cyclical effect, which entails a decrease in safety problems due to the economic decline.

The counter-cyclical effect is supported by a publication from the International Labour Office (ILO, 2009), which demonstrated the negative effects downsizing processes had on the global labor market due to the financial crisis in 2008. The report stated that the recession had a negative impact on safety activities. Furthermore, the downscaling lead to an increase in outsourcing, subcontracting activity, temporary work and shorter hours. Quinlan and Bohle (2009) investigated how downsizing and increased job insecurity affected the occupational health, safety, and well-being of workers (OHS-outcomes). The authors conducted a literature review of 86 studies and found that 85% of the studies included had identified significant negative effects on workers' health and well-being as a result of job insecurity and downsizing. They also expected downsizing to have an effect on number of injuries, OHS-training, knowledge and compliance due to understaffing, multi-skilling and job reassignment, or accompanying management problems. The way the management proceeds with the downsizing process can modify negative effects on workers' health. Pepper, Messinger, Weinberg, and Campbell (2003) found that how the downsizing process was perceived by the

surviving employees affected their health. Those who felt that the downsizing process was fair, done properly and with open and honest communication from the management, reported better health than those who did not have this impression.

Following the proposed pro-cyclical effect, there is a probability that safety problems decrease and safety climate in the workplace improves during a recession. The healthy worker effect is used to describe the notion that people must be relatively healthy to work (Li & Sung, 1999). Quinlan and Bohle (2009) suggested that redundancy programs may create a situation where the healthiest employees are left in the organization, leaving the organization with a more robust group of workers. The ILO (2009) report presented a similar pattern, where immigrants, low-skilled workers and older workers are especially at risk during redundancy processes.

Theorell et al. (2003) found a reduction of long-term sick leave in female employees after a downsizing process. However, the same results were not found among male workers, so it is difficult to draw any clear conclusions. Cameron (1994) and Cameron, Freeman, and Mishra (1991) viewed downsizing as an opportunity to improve efficiency and reduce labor costs, and claimed that by implementing the correct strategies, downsizing can lead to a better and more effective organization. Pierce (1998) found some of the same results in a case study of a manufacturing company. Injury rates increased at first after organizational streamlining, but after devising and implementing effective leadership strategies, the injury rates went down. The author concluded that downsizing can benefit safety and health efforts.

The human factors literature has since the mid-90s established that situational awareness can negatively or positively affect the workplace safety in safety-critical organizations (Durso & Sethumadhavan, 2008). However, the interest for how situational awareness can impact safety climate in a dynamic environment has not experienced the same peak in the safety climate literature. The lack of interest may be due to the fact that situational

awareness is a challenging variable to measure, as it is dynamic variable compared to safety outcomes (Casey et al., 2017). Despite the shortage of research, it is probable that situational awareness may have a positive influence on the surviving workers' safety climate during a recession, and thus serve as a pro-cyclical effect. Situational awareness is a concept commonly defined as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future" (Endsley, 1988, p. 97). In other words, gaining situational awareness involves perceiving and understanding a current situation, while at the same time being able to anticipate future outcomes (Endsley, 1988). Moreover, situational awareness can be obtained in a team if each team member possesses the situational awareness required for their responsibilities and goals (Endsley, 1995). In addition, the team members must know how the elements in their environment are connected and integrated with the other team members' elements. If one member fails to achieve the situational awareness for their requirements, the whole team may be endangered, and thus threaten the workplace safety (Endsley & Jones, 2012).

A related concept is shared situational awareness. Endsley and Jones (1997, p. 47) defines shared situational awareness as "the degree to which team members possess the same situational awareness on shared situational awareness requirements". This means that the team members must share an understanding of the information that is necessary for each member, but also an understanding of what is common (Endsley & Jones, 2012, 1997).

Kanki and Foushee (1989) demonstrated that teams consisting of a captain and first officer who had flown together and were familiar with each other, made less errors, performed better and engaged in more open communication and information exchange than newly paired teams. Moreover, National Transportation Safety Board reported that 44% of

accidents in commercial aviation occur on trips with newly paired crews, and 73% occur on the first day of the pairing (Endsley & Jones, 2012; NTSB, 1994).

Following this logic, it could be possible that downsizing due to a recession can lead to better performing teams and shared situational awareness, as the companies do not hire new workers, which leaves them with a group of workers that know each other well, and thus creates a strong safety climate. In addition, it is generally the most skilled and experienced employees that keep their job. In relation to the maritime industry, it may be that while there are fewer vessels sailing, those vessels in operation sail with a highly qualified crew, thus reducing safety problems and accidents.

Recession and health outcomes

Previous research has shown negative health outcomes for employees during times of economic instability. A meta-analysis by Mucci, Giorgi, Roncaioli, Perez & Arcangeli (2016) showed that a recession had a negative impact on both mental and physical health of workers, with several studies showing an increase in mood disorders as well as cardiovascular and respiratory diseases after the 2008 economic recession. Financial insecurity has been linked to detrimental health effects, with work-family conflict and stress serving as possible moderators (Odle-Dusseau, Matthews, & Wayne, 2018). Poor health is in turn likely to affect job performance. Houdmont, Kerr & Addley (2012) found that psychosocial hazard exposures increased during a recession. They also reported an increase in work-related stress prevalence and stress-related sickness absence. In addition, others have found a positive relationship between recession-related stressors, like increases in workload or reorganizing of job assignments and strain (Jones, Sliter, & Sinclair, 2016). Research has demonstrated that strain is negatively related to safety climate, and that strain increase the probability of injuries (Fogarty, 2005; Rundmo, 1992). A recession may also lead to an increase in psychosocial problems in the workplace, for instance violence, harassment and bullying (Curtarelli, Fric,

Vargas, & Welz, 2014; Salin, 2003). Many of the negative effects mentioned in safety context are also related to higher job insecurity, suggesting a link between job insecurity and safety climate.

Research questions

The literature review indicates that experiencing a recession will be related to higher job insecurity among employees. However, not all studies support this pattern unanimously (Erlinghagen, 2008; Mau et al., 2012). The aim was therefore to learn more about how the recession in 2014 had affected job insecurity perceptions between 2013 and 2017. The first research question was as follows;

Research question 1: Has the perception of job insecurity among workers on offshore vessels changed following the 2014 recession in the Norwegian petroleum industry?

The literature review suggests that there may be different mechanisms at play in terms of whether a recession results in an increase or a decrease in safety climate. The aim was to therefore to investigate how the perceptions of safety climate among workers on offshore vessels had changed after experiencing a recession in the Norwegian petroleum industry in 2014. We inquired exclusively about the period from 2013 to 2017. Before the interviews commenced we formulated the second research question as follows:

Research question 2: Has the perception of safety climate among workers on offshore vessels changed following the 2014 recession in the Norwegian petroleum industry?

In order to explore the two research questions, we applied a mixed methods design. Using mixed methods involves the combination of different method approaches, and in our

thesis this means combining qualitative interviews and quantitative surveys (Kvale, 2007). Lund (2012) highlights four general advantages of a mixed methods approach; (1) one might be able to answer more complex research questions, (2) the combination of several approaches gives a more complete insight on the field of research, (3) possible higher validity and (4) nuanced and reflected results. More specifically, we used an exploratory sequential design, where we first did a qualitative study which served as a basis for the quantitative study (Fetters, Curry, & Creswell, 2013). In the following, we applied a two-study design to investigate safety climate and job insecurity perceptions amongst employees in shipping companies servicing the petroleum industry during a five-year period from 2013 to 2017.

Study 1

Introduction

Study 1 used a qualitative data collection and consisted of four interviews with health, safety, environment and quality (HSEQ) managers conducted in October 2017. The interviews explored a variety of safety perceptions of HSEQ managers in Norwegian shipping companies who had ongoing contracts with a major Norwegian hydrocarbon producing company, and gained detailed descriptions of safety issues from 2013 to 2017. The aim of Study 1 was to gain insight into how the HSEQ managers had experienced the period prior to and following the 2014 oil crisis, with a particular focus on their perceptions of safety climate and job insecurity during the period from 2013 to 2017. The results served the purpose of providing answers to our research questions and were also used to inform the hypothesis development for Study 2.

Method

Design and procedure

The design of the Study 1 was qualitative semi-structured interviews. A semi-structured interview is an interview where the researcher develops an interview guide with a set of open-ended questions to ask the interviewees in advance of the interviews (Ayres, 2008). Our interview guide was made by choosing areas to investigate further based on the variables in the quantitative surveys. We conducted a pilot interview prior to the interviews in order to assure that the topics and questions were suitable.

The interview guide was structured around three main themes (safety climate, job insecurity and safety training), and seven variables (safety climate, comparison of safety focus, attitudes towards safety work, compliance with safety practices, attitudes towards reporting, job insecurity and safety training). Each variable had one main question and a set of follow-up questions. The main questions were open-ended to encourage the interviewees to speak freely and to gain as much information as possible. Leading questions were avoided to prevent any bias. All the interviewees were asked the same main questions, while the follow-up questions were adjusted according to the answers which were given.

Three interviews were conducted in person and one was scheduled through Skype. Due to technical difficulties, the Skype-interview had to be conducted over the phone. The interviews were audio-recorded and lasted approximately 1.5 hours each.

Ethical considerations

The HSEQ managers read and signed an informed consent document before commencing the interview. The consent document provided information about the study and their right to withdraw from the study at any point. They were in a position to decline the audio recording, however, all agreed. The audio recordings will be deleted 15.05.2018, and the data from the interviewees will be used exclusively for the present master thesis. The

HSEQ managers were offered a copy of the thesis after completion, but were not offered any other type of reward or compensation. It was not deemed necessary to notify NSD (Norwegian Centre for Research Data) about the qualitative interviews, as there is no use of direct quotes from the participants and no personally identifiable background information was registered in the data material.

Sample characteristics

The sample for the qualitative data was four HSEQ managers in Norwegian shipping companies. A meeting for HSEQ managers were arranged by the client company in September 2017, and four managers kindly agreed to contribute to the study. Three of the participants had worked with HSEQ for at least four years. One had been HSEQ manager for shorter than four years but had worked in the shipping company for a long time and therefore had insight on HSEQ-matters. During one of the interviews both the operations manager and the HSEQ manager were present.

Results

A template analysis was performed to analyze the interviews and structure the findings. A template analysis is an analysis "which emphasizes the use of hierarchical coding but balances a relatively high degree of structure in the process of analyzing textual data with the flexibility to adapt it to the needs of a particular study" (Brooks, McCluskey, Turley, & King, 2015, p. 203). The recommended strategy of Brooks et al. (2015) was followed and the template analysis produced seven main themes that occurred in the interviews: (1) Recession; (2) Safety climate; (3) Attitudes towards safety work; (4) Safety practices; (5) Attitudes towards reporting; (6) Safety training; and (7) Job insecurity. Below follows a brief outline of each main theme, leading up to the main research questions and hypotheses of this study. The template can be found in appendix A.

(1) Recession

The first theme tried to uncover whether the HSEQ managers had experienced a downturn in the petroleum industry between 2013-2017. The informants confirmed that there had been and still was an ongoing oil recession in the petroleum industry, and that they were strongly affected by the decline in oil prices which began in 2014. The time and duration of the crisis was consistent across the interviews. As of October 2017, when the interviews were conducted, the market was still considered insecure and the industry not fully recovered to pre-recession standards. The most serious consequence of the recession was downsizing and/or restructuring of the workforce at the shipping companies. A large percentage of the workforce had been laid off after 2014, and for some this proved to be a challenge when they won contracts and there was a shortage of qualified staff available on short notice. Hiring new personnel is time consuming and it may be difficult to include new people into an existing established safety culture.

(2) Safety climate

The second theme examined safety climate and safety focus at the shipping companies. The HSEQ managers reported a high safety focus and a strong safety climate in their company. All informants described an increased safety awareness during and after the recession as a result of a greater competition in a significantly tougher market. Interestingly, they argued that a favorable safety reputation was an important contributing factor when competing for contracts, and that they were dependent on continuously improving their safety records in order to win contracts.

Their claim of a good safety climate was supported by the companies' statistics, which reported low occurrences of LTIs (lost time injuries) and few major incidents. Frequent communication and dialogue between the land organization and vessels, as well as regular

visits on board the vessels were identified by the informants as some of the primary explanations for upholding a strong safety climate.

(3) Safety attitudes

The third theme explored safety attitudes and in particular the assessment of the maritime workers' safety attitudes, for instance their perception of how important mandatory safety procedures are for completing a work-task. The informants reported a strong safety focus among the employees and overall good safety attitudes, however, they claimed that safety attitudes amongst maritime workers have to be continuously endorsed by the management and captain. Furthermore, they had not observed changes in safety attitudes between 2013 and 2017.

The informants indicated some generational differences in safety attitudes amongst the maritime workers as the younger and new arrivals receive more theoretical schooling in safety work and safety issues compared to those before them. However, they also reported that formal education does not replace extensive practical knowledge and experience which the new arrivals can benefit from. As the layoffs impacted mostly the younger and less experienced staff, a core of more experienced crew members was left on board the vessels. This indicates that the recession period could have led to a more experienced crew on board in this critical period.

(4) Safety practices

We inquired about the safety practices of the shipping company, including compliance and breaches of practices. The informants stated that they were just as good on complying with safety practice as any other Norwegian shipping company, although they also stated that no one is perfect and mistakes and breaches of practice do occur. Breaches were mainly

attributed to human factors, for instance if someone neglects to use the necessary equipment throughout an operation or loss of situational awareness.

(5) Reporting attitudes

The informants were asked to elaborate on maritime workers' attitudes regarding reporting undesired events at work and if they observed any changes between 2013 and 2017. The informants stated that the crews' reporting attitudes were positive. Furthermore, they had the impression that the threshold for reporting had declined, which indicated high standards in reporting attitudes. There were some variations in the amount of reports they received from different vessels and shifts. According to the HSEQ managers, less reports do not necessarily imply a substandard safety performance, but merely reflect different attitudes on what is worth reporting. However, if shifts or vessels were lagging behind on reports in a problematic manner, then the HSEQ-managers resolved the issue.

Another challenge was the lack of standardized reporting forms, where the reports end up being highly subjective and filling out the report can be an excessively time-consuming task, and thus a source for under-reporting. A few informants mentioned an under-reporting tendency when the crisis peaked in 2015 due to a fear of consequences, for instance losing their job, endangering colleagues' jobs or draw undesirable attention (cause bad reputation) to the vessel and/or the shipping company. The worry of unwanted attention is somewhat justified as reputation is one of the factors clients take into account in the hiring process.

(6) Safety training

This theme examined the quality on safety training of the HSEQ managers and other employees at the shipping company. The informants judged their own safety training to be good as they have completed mandatory courses required for the position and due to safety training experience accumulated throughout their career. Furthermore, they reported that the maritime workers' safety training was of high standard as a result of strict safety regulations.

On the other hand, the safety training for the land organization was not prioritized as the probability of accidents was unlikely. The majority of informants advocated the use of a safety coach and viewed them as a resource and supplement to maritime workers' safety training on the vessels. Feedback from the maritime workers stated that training exercises on board the vessel are especially important as it gives them real-life experience in case of emergencies. The economic downturn affected the safety training, but merely in non-required courses.

(7) Job insecurity

The last theme explored job insecurity. The HSEQ managers themselves reported low job insecurity as they worked in an industry with high potential for adverse events, and thus the HSEQ-area is not an eligible candidate for cutbacks. The job insecurity of other employees at land and at sea was much higher compared to the informants. The maritime workers' job insecurity had been especially high as there have been many vessels in lay-up. Furthermore, there were some slight variations on the informants' future career in the company for the next 5-10 years. Most of the informants were fairly confident that they would keep their current position or a similar one, while others were more reserved as the development in the market is still insecure and fluctuating. However, all remained cautiously optimistic.

Discussion

Even though safety climate is an separate theme in the template analysis, we propose that safety attitudes, safety practices and reporting attitudes are also a measurement of safety climate, as they correspond with the safety climate definition that is "shared perceptions with regard to safety policies, procedures, and practices" (Zohar, 2011, p. 143). In conclusion, the template analysis provides us with four variables that measures safety climate.

The information derived from the interviews revealed a compliance between prior research and theory concerning job insecurity, which indicates that a recession will increase workers' perceptions of job insecurity. In other words, the economic situation in the industry is thought to have a negative effect on workers' perceived job insecurity.

The literature review suggests that a recession can have both positive and negative effects on safety climate. For instance, the counter-cyclical effect states that a recession leads to an increase in safety problems due to the stress caused by redundancy processes, while the pro-cyclical effect states that a decrease in safety problems may occur due to the economic decline. The HSEQ managers perceived that the safety climate had been stable, and even improved during and after the recession, supporting the notion of a pro-cyclical effect. Thus, the informants' statements and literature illustrate some discrepancies regarding safety climate following a recession.

Study 2

Introduction

In Study 2, we utilize quantitative survey data collected in 2013, 2015 and 2017 among offshore vessel employees in Norwegian shipping companies working in the petroleum industry. Based on the results of the interviews with the HSEQ managers in Study 1, we formulated two hypotheses to be tested in Study 2. The first hypothesis relates to the perceived job insecurity of the workers. Based on the theoretical framework and the results of Study 1, we expect perceptions of job insecurity to have increased following the 2014 oil crisis. The quantitative analysis will reveal whether the workers experienced a change in perceptions of job insecurity between the two time points 2013 and 2017. We postulate the first hypothesis as follows:

Hypothesis 1: *Job insecurity perceptions among vessel employees will increase from 2013 to 2017.*

The second hypothesis aims to explore the subjective safety climate perceptions among workers on offshore vessels over three time points; 2013, 2015 and 2017. The 2013 surveys provide us with a pre-recession measurement, the 2015 surveys contribute as the amid-recession measurement and the 2017 surveys provided us with both a amid/post-recession measurement. Based on the interviews with the HSEQ managers in Study 1, we expect an improvement in perceptions of safety climate over time among the offshore vessel employees. We postulate the second hypothesis as follows:

Hypothesis 2: *Safety climate perceptions among vessel employees will show an increase over the time points 2013, 2015 and 2017.*

Method

Design and procedure

The quantitative data consisted of three large cross-sectional surveys from all the vessels on hire for a major oil and gas producing company in Norway. Surveys were collected in 2013, 2015, 2017 and measured safety issues and work environment. All the crew members on every vessel on hire for the client company were invited to take part in the study. Participants were employed at different ship-owning companies. The data collections in 2013, 2015 and 2017 were similar in terms of design and procedure. The surveys did not include any information enabling individual responses to be linked over time. Thus, it was not possible to find out whether the same individuals answered at the different time points or to analyze within-person changes. The surveys were written in Norwegian. Participation in the study was encouraged but was neither mandatory nor rewarded. Surveys were filled out individually during rest time on board the vessel, then sent directly to the researchers at the

University of Bergen in a pre-paid envelope. Anonymity was ensured by making sure the completed surveys could not be linked to individuals, vessels or shipping companies.

Anchoring vessels received 40 surveys, while other vessels received 30. Surveys were divided between the two alternating shifts on board. The crew and the captain completed the same surveys in 2013 and 2015, however, they were given separate surveys in 2017. Surveys were distributed to 62 vessels in 2013, 37 in 2015 and 58 in 2017. The number of returned surveys from the vessels varied. The researchers received 844 valid surveys from 49 vessels in 2013, while only 461 valid surveys from 27 vessels were returned in 2015. The researchers received 565 valid surveys from 34 vessels in 2017. A total of 1870 questionnaires had been returned to the researchers by the end of November 2017. There were some variations in the response rate. The surveys collected in 2013 had the highest response rate (45.1%) compared to 2015 (24.7%) and 2017 (30.2%).

Ethical considerations

The first page of the surveys consisted of information about the study and consent. It was emphasized that participation was voluntary and that respondents could withdraw from the study at any point without having to provide an explanation. Furthermore, it was made clear that only an anonymized summary of the overall results would be provided to the client company (the hydrocarbon producing company) and the shipping companies, and that the client company would not be able to compare different shipping companies or vessels. The respondents were not given any rewards for participating in the studies. The three surveys have been advised by NSD (Norwegian Centre for Research Data). The project numbers are 32364 in 2013, 40412 in 2015 and 51881 in 2017, and are available at www.nsd.uib.no.

Sample characteristics

The sample consists of crew members employed at various ship-owning companies on hire for a client company at the time of data collection. Details of sample characteristics across the three data collections are provided in Table 1.

The respondents were predominantly Scandinavian. Less than 10 % of the respondents at the different data collections were ship captains. A large majority of the respondents had permanent positions at the ship-owning-companies, while some were temporary employed or apprentices. The surveys did not inquire about gender to prevent women from being identified. We assume the sample is predominantly men. There was a fairly equal distribution amongst participants in the various age groups.

Table 1. Sample characteristics across the three data collections

	2013		2015		2017	
Variable	N	%	N	%	N	%
Ship function						
Emergency preparedness	168	20.4	123	27.5	12	24.5
Supply	547	66.5	259	57.9	30	61.2
Anchor handling	92	11.2	61	13.6	7	14.3
Other	16	1.9	4	0.9	0	0
Nationality [a]						
Scandinavian	-	-	374	90.3	484	92.2
Other	-	-	40	9.7	41	7.8
Captain or crew						
Captain	61	7.3	33	7.4	52	9.2
Crew	774	92.7	413	92.6	513	90.8
Age category						
Under 26 years	173	20.5	111	24.8	84	15.2
26-30 years	136	16.2	65	14.5	80	14.4
31-35 years	89	10.6	51	11.4	71	12.8
36-40 years	93	11	45	10	46	8.3
41-45 years	103	12.2	44	9.8	57	10.3
46-50 years	82	9.7	44	9.8	76	13.7
51-55 years	89	10.6	34	7.6	50	9
Over 55 years	77	9.1	54	12.1	90	16.2
Employment relationship						
Permanent	721	85.6	388	87	414	82.1
Temporary	42	5	15	3.4	45	8.9
Apprentice	79	9.4	43	9.6	45	8.9
Tenure						
0-2 years	399	47.3	152	33.9	100	18
3-5 years	209	24.8	130	29	146	26.3
6-10 years	142	16.8	117	26.1	167	30
11-20 years	70	8.3	40	8.9	114	20.5
More than 20 years	23	2.7	10	2.2	29	5.2
Department						
Bridge	253	30.6	138	30.7	144	28.5
Deck	284	34.3	162	36.1	182	36
Engine room	232	28.1	127	28.3	148	29.2
Galley	55	6.7	20	4.5	32	6.3
Other	3	0.4	2	0.4	0	0

Note. [a] Nationality was not measured in the 2013 surveys.

Instruments

Safety climate was measured with 6 items from Zohar and Luria (2005)'s Multilevel Safety Climate Scale in 2013, 2015 and 2017. The six items covered safety climate on three different levels, with two items on the captain-level, two items on the ship-owning company-level and two items on the client company-level. The wording of the items was similar across levels, while the first part of the items differed across levels, referring to "The captain…", "The ship-owning company…", or "The client firm…". The name of the carbon-producing company was inserted in place of "The client firm". The two items covering the ship-owning company level were "The ship-owning company emphasizes working safely when work falls behind schedule" and "The ship-owning company immediately corrects all sources of risk, even when it entails costs", and corresponding items were used at the captain level and client company level. Responses were obtained using a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). Cronbach's Alpha coefficients for the six items scale were obtained separately for the three time measures. Cronbach's Alpha coefficient refers to the scale's internal consistency and indicates the extent to which the items in the scale measure the same underlying construct. In other words, it refers to how the items in the scale fits together. Values above .8 are considered preferable, however, values above .7 are acceptable (DeVellis, 1991). Cronbach's Alpha for the six-item scale was above .8 in 2013 (.821), 2015 (.810) and 2017 (.873). Consequently, we combined the six items into a single index of overall perceived safety climate to be used in our main analyses. Following Zohar and Luria (2005), we also computed separate indexes for safety climate at the three different levels, and used these separate indexes in follow-up analyses.

Note that the surveys distributed in 2013 and 2015 contained 44 safety climate items from Zohar and Luria (2005)'s Multilevel Safety Climate Scale, while only six of these were measured in 2017. Due to our interest of having identical measures across time points, we

report the results obtained using the six items on safety climate that were similar in 2013, 2015 and 2017 in our main analyses. This rules out the possibility that the results regarding differences across time points are affected by different number of items and different item wordings. However, in the interest of also utilizing all the available data and the items covering broader aspects of the safety climate concept, we also carried out additional analyses of differences in safety climate from 2013 to 2015 using all 44 available safety climate items in 2013 and 2015. The results of these additional analyses and the conclusions drawn from them were, for all practical purposes of this study, identical to the results obtained using the six-item version of the scale. Thus, we only report the results of the analyses obtained using the six-item version.

Job insecurity was measured in 2013 and 2017 with three items from a scale developed by Hellgren, Sverke, and Isaksson (1999). The 2015 surveys did not include any items measuring job insecurity. An example of an item would be "I'm concerned that I may have to leave my job earlier than I would have liked to". Participants answered on a 5-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). Cronbach's Alpha for the job insecurity scale in 2013 (.623) was lower than the proposed acceptable threshold of .7, while the value in 2017 (.793) was acceptable, but below the preferable .8 threshold. Cronbach's Alpha values are, however, generally sensitive to the number of items in a scale, especially if the scale has fewer than 10 items (Pallant, 2013). An alternative to Cronbach's Alpha when working with short scales is to report the mean inter-item correlations, where mean inter-item correlations in the range of .2 to .4 have been suggested to be acceptable (Briggs & Cheek, 1986). The scale for job insecurity was relatively short (3 items), which makes it a contender for reporting the mean inter-item correlations. The mean inter-item correlations for the job insecurity scale in 2013 (.362) and 2017 (.560) were within an acceptable range.

Statistical analyses

All statistical analyses were carried out using SPSS 24.0. Respondents were included in the analyses as long as they had provided valid responses for at least ⅔ of the items making up the scale being analyzed. Descriptive statistics were used to examine the mean levels and dispersion of scores for the main study variables, while Pearson product-moment correlation coefficients were used to explore bivariate relationships between the main study variables within the three time points. Following the approach advocated by Becker (2005), we tested our hypotheses both with and without including control variables. Using separate between-groups analyses of variance (ANOVA), we tested the main effect of year while also including age, tenure at the ship-owning company, employment type (permanent, temporary or apprentice) and captain status (ordinary crew member or ship captain) as control variables, in order to account for the potential impact of these control variables on perceptions of job insecurity and safety climate. However, the estimates of the effect of year were practically similar in the analyses run with and without control variables. Consequently, we only report the results of the analyses run without control variables, for the sake of parsimony (Becker, 2005). Furthermore, as two of the safety climate items were about the respondents' perceptions concerning the ship captain, we decided to exclude the respondents who were ship captains in all the reported analyses predicting safety climate, although supplemental analyses showed that the results did not change when the captains were included in the analyses.

An independent samples t-test was used to test Hypothesis 1 concerning job insecurity perceptions in 2013 compared to in 2017. Hypothesis 2 was tested using a one-way between-groups ANOVA, with perceptions of overall safety climate as the dependent variable and year of data collection as the grouping variable. In addition to examining differences in overall safety climate over time using an ANOVA, we also conducted a multivariate analysis of variance (MANOVA) in order to examine differences in the three levels of safety climate

over time. A MANOVA compares the groups' mean scores on a combination of dependent variables, and thus tests whether there are significant differences between the groups on the dependent variables. An advantage of running a MANOVA is that the probability for type 1 errors (false positive) is reduced compared to if separate ANOVAs are run for each dependent variable (Pallant, 2013). We set the alpha value at .05 for all analyses, and adopted a more stringent alpha value in cases where this was recommended due to violation of test assumptions (Pallant, 2013).

Results

Descriptive statistics and intercorrelations for the main study variables are displayed in Table 2.

Table 2. Descriptive statistics and intercorrelations for main study variables.

Variable	M	SD	1	2	3	4
2013						
1. Job insecurity	2.07	0.92				
2. Safety climate overall	4.09	0.68	-.19**			
3. Safety climate captain	4.40	0.73	-.16**	.76**		
4. Safety climate shipping company	3.88	0.93	-.17**	.80**	.51**	
5. Safety climate client company	3.93	0.93	-.11**	.81**	.41**	.51**
2015						
1. Job insecurity [a]	-	-				
2. Safety climate overall	4.07	0.68	-			
3. Safety climate captain	4.35	0.71	-	.73**		
4. Safety climate shipping company	3.98	0.87	-	.81**	.52**	
5. Safety climate client company	3.87	0.98	-	.81**	.34**	.53**
2017						
1. Job insecurity	3.00	1.17				
2. Safety climate overall	4.13	0.75	-.09*			
3. Safety climate captain	4.40	0.75	-.05	.84**		
4. Safety climate shipping company	4.08	0.89	-.15**	.88**	.69**	
5. Safety climate client company	4.01	0.90	-.09*	.89**	.58**	.72**

Note. [a] Job insecurity was not measured in 2015.
* $p < .05$, ** $p < .01$

As evident in Table 2, job insecurity was negatively related to overall perceptions of safety climate both in 2013 (r = -.19, p < .01) and in 2017 (r = -.09, p < .01). Moreover, the three safety climate dimensions were moderately to strongly related to each other across the three time points (r = .34 to r = .72).

Hypothesis 1 stated that perceptions of job insecurity would be higher in 2017 than in 2013. An independent-samples t-test was carried out to compare the job insecurity scores obtained in 2013 and 2017. As the Levene's test for equality of variances was statistically significant (F = 42.55, p < .001), we report the results of the t-test not assuming equal variances for the two groups. The results indicated that the mean levels of job insecurity were significantly higher in 2017 (M = 3.00, SD = 1.17) than in 2013 (M = 2.07, SD = 0.92, t (982.2) = 15.7, p < .001, two-tailed). Thus, Hypothesis 1 was supported. The magnitude of the difference in the means (mean difference = 0.93, 95% CI: 0.81 to 1.04) was large (eta squared = 0.153).

Hypothesis 2 predicted that perceptions of overall safety climate would increase over the time points 2013, 2015 and 2017. A one-way between-groups ANOVA was conducted to compare differences in overall safety climate scores across three-time points 2013, 2015 and 2017. The results indicated that there were no significant differences in perceptions of overall safety climate across the three time points, F (2, 1669) = 0.71, p = .492. Thus, Hypothesis 2 concerning increases in overall safety climate scores over time was not supported.

As the overall safety climate scale was comprised of items covering safety climate at three different levels, we also ran a one-way between groups multivariate analysis of variance (MANOVA) as a follow-up analysis to explore whether year had an effect on safety climate when safety climate was divided into its three levels. Perceptions of safety climate specific to the captain, shipping company, and the client company were used as dependent variables, while year of data collection was entered as the independent variable. Preliminary assumption

testing revealed a significant Box's test of equality of covariance matrices across groups, Box's M = 96.34, $p < .001$, indicating that the covariance matrices among of the three safety climate dimensions were different across years. However, following the warning by Tabachnick and Fidell (2014) that the Box's M test is too conservative in cases where the sample size is high, we proceeded with the analysis. As the Levene's test of equality of error variances was significant for the two dimensions of safety climate concerning the captain ($p = .045$), the ship-owning company ($p = .041$) and the client company ($p = .010$), we set the alpha value for the univariate F-test for these variables to .01, following the suggestions of Tabachnick and Fidell (2014). The results of the MANOVA showed that there was a statistically significant effect of year on the three safety climate dimensions combined, F (6, 3288) = 4.94, $p < .001$; Wilks' Lambda = .98; partial eta square = .009. Inspecting the three dimensions of safety climate separately revealed that a significant effect of year was found only for the safety climate dimension concerning perceptions of the ship-owning company, F (2, 1645) = 6.08, $p = .002$, partial eta squared = .007, although the effect size was very small. Post hoc comparisons testing using Tukey HSD indicated that the safety climate scores concerning the ship-owning company were significantly higher in 2017 (M = 4.05, SD = 0.91) than in 2013 (M = 3.87, SD = 0.94, $p < .001$), whereas the scores obtained in 2015 (M = 3.95, SD = 0.88) did not differ significantly from the scores obtained in 2013 or 2017. The results indicate that the crew's assessment of the ship-owning company's safety climate was more positive in 2017 than in 2013. Still, the effect size was very small, as year of data collection only explained 0.7 % of the variance in the crew's perceptions of the ship-owning company's safety climate. The crew's perception of safety climate concerning the captain, F (2, 1645) = 1.32, $p = .27$, or the client company, F (2, 1645) = 1.76, $p = .17$, did not vary across the three time points.

Discussion

Based on the literature review and the results of the interviews with the HSEQ managers in Study 1, Study 2 tested two hypotheses using survey data collected in 2013, 2015 and 2017 among vessel workers employed at shipping companies servicing a major hydrocarbon producing company. Hypothesis 1 was supported, as average levels of perceptions of job insecurity among employees at the vessels were substantially higher in 2017 (amid/post-recession), than in 2013 (pre-recession). Hypothesis 2 was not supported, however, as the offshore vessel workers' perceptions of overall safety climate did not significantly differ across the data collections in 2013, 2015 and 2017. Thus, the results indicate a stability in perceptions of overall safety climate. However, follow-up analyses indicated that the crew's assessment of the ship-owning company's focus on safety climate was more positive in 2017 than in 2013, which corresponded with the HSEQ managers' experiences in Study 1. This suggests a slight improvement in perceptions of safety climate specific to the shipping company level from 2013 to 2018, although the effect size was small and only accounted for 0.7 % of the variance in safety climate.

General discussion

The objective of the present master thesis was to uncover if the 2014 recession in the petroleum industry was related to changes over time in job insecurity and safety climate perceptions among maritime workers on contract for a major hydrocarbon producing company. The thesis describes a two-study design. Study 1 entailed qualitative interviews with subject matter experts employed at the ship-owning companies. The results of Study 1 provided in-depth information about how the recession had been experienced by HSEQ managers in four shipping companies, and also generated the hypotheses postulated in Study 2, which utilized survey data collected among maritime workers in order to examine

differences in perceptions of job insecurity and safety climate over time. Based on theory and prior research, we expected perceptions of job insecurity to be higher following the recession in the petroleum industry than before the recession, and this was supported both by the impressions of the HSEQ managers in Study 1 and in the statistical analyses comparing job insecurity perceptions among vessel employees in 2013 and 2017 in Study 2. The findings thus clearly indicated that perceptions of job insecurity among the workers on offshore vessels on contract with the hydrocarbon producing company increased from pre-recession in 2013 to amid/post-recession in 2017. Regarding perceptions of safety climate following a recession, the literature review revealed competing mechanisms suggesting both positive and negative effects of a recession on safety. Based on the results from Study 1 indicating that the HSEQ managers perceived safety climate to have improved following the 2014 recession, Study 2 tested the hypothesis that perceptions of safety climate among vessel employees would increase from the pre-recession in 2013 to amid-recession in 2015 and amid/post-recession in 2017. Contrary to our predictions, perceptions of overall safety climate did not differ across the three time points. However, exploratory analyses revealed that perceptions of safety climate at the ship-owning company level, as opposed to at the captain-level and the client company-level, were somewhat higher amid/post-recession, in 2017, than pre-recession, in 2013, although the effect size was small. In the following, we discuss these findings and their implications in more detail.

Job insecurity

The interest in job insecurity and its content, causes and consequences has increased over the last decades, as a result of a changes and developments in the work environment due to new technology, economy and politics (Shoss, 2017). Our results showed that job insecurity was perceived to be higher after the onset of the recession; a result which was consistent across both studies. The studies contribute to the field of research by indicating that

there is a link between the economic climate in the petroleum industry and employee perceptions of job insecurity, and hence that objective factors may influence perceived job insecurity. This finding supports previous patterns. For instance, the global oil crisis in the early 1980s led to high unemployment rates and job losses, as well as increased job insecurity in the UK (Burchell, Wilkinson, & Lapido, 2002). Similarly, Anderson and Pontusson (2007) and Erlinghagen (2008) found positive relationships between unemployment rates and job insecurity. An International Labour Office report (ILO, 2013) stated that especially youths struggled in the labor market five years after the recession. We have not included unemployment rate in our analyses, but according to Statistics Norway (2017) the unemployment rate in Norway has increased in the same period as our measured increase in job insecurity, suggesting a similar pattern.

In addition to labor market characteristics, there has been organizational change in the shipping companies like downsizing and restructuring, as well as an uncertain future for the organization which are mentioned as objective factors by Sverke and Hellgren (2002). This consolidates these factors as predictors of job insecurity. However, there are some discrepancies in the literature. For instance, Mau et al. (2012) did not find a significant impact of unemployment rate on job insecurity. Erlinghagen (2008) did not find associations between job insecurity and objective factors like a country's current economic situation (measured by gross domestic product growth), expenditure on social protection or level of dismissal protection. Still, the majority of the existing research supports our findings of recession as a predictor of job insecurity.

There may be other contributing factors to heightened job insecurity perceptions in times of economic instability. Former research has shown that workers' educational level and the type of industry under investigation may influence the degree of perceived job insecurity. We did not map our participants' educational level, but we do know that job insecurity tends

to be higher for less-educated and that blue-collar workers often experience more job insecurity than white-collar workers (Erlinghagen, 2008; Green, 2009; Mau et al., 2012; Näswall & De Witte, 2003). A possible reason for the increase in job insecurity among participants in Study 2 might be that they felt that the psychological contract with the employer was threatened or broken during the economic downturn. We did not include personality measures in either of the studies' analyses, but previous research has shown a link between certain personality traits and job insecurity, which may have an impact of the results (Debus, Probst, König, Kleinmann, & Kozlowski, 2012; Keim, Landis, Pierce, Earnest, & Hurrell, 2014; Kinnunen, Feldt, & Mauno, 2003; Låstad, Berntson, & Näswall, 2014).

International competition in the labour market could heighten maritime workers' job insecurity as well, especially if the shipping companies hire workers who accept lower wages, and thereby move jobs to other parts of the world in order to make it through the recession. Furthermore, new technology may elevate job insecurity perceptions in the petroleum industry and its service suppliers, as there are some indications that the industry is moving towards a reduced demand for human labor, as enhancements in technology make it possible to replace workers with robots, and thus operate systems more automatically. The new oil field Johan Sverdrup, which is expected to start production in late 2019, is characterized by more digital solutions and automatization than previous platforms (Statoil, 2018). On the one hand, the industry is moving towards more automatization and a reduced need for workers, but on the other hand there may be a shortage of skilled workers in the future for two possible reasons; one being the decline in petroleum-related studies and the other because workers who were hired in the 80s when the industry was booming are getting closer to retirement age (Lynum & Dons, 2017). Overall, this makes it hard to predict the future job security in the oil and gas industry.

Safety climate

A limited amount of research has investigated the impact of an economic crisis on occupational safety in high reliability organizations. In addition, the existing research is inconclusive, which demonstrates a field worth exploring (Boustras & Guldenmund, 2017). Thus, our research contributes to an underexplored field of study.

The results from Study 2 indicate that the perceptions of overall safety climate among vessel employees neither deteriorated nor strengthened following the 2014 oil crisis. When breaking the overall safety climate scores down to its different levels, vessel employees' perceptions of safety climate specific to the captain or the client company did not differ across the three time points, while there was a small improvement in perceptions of safety climate specific to the shipping company from 2013 to 2017. Overall, the findings thus mostly suggest a stability in safety climate perceptions over time following the 2014 oil crisis, while also providing some indications of a small improvement limited to the employees' perceptions of the shipping companies. In the following, we will discuss these findings in light of our theoretical framework and previous research, starting with the most consistent finding indicating stability in safety climate perceptions over time.

Firstly, the strict international legislation and regulations in the petroleum industry prohibits and minimizes the oil companies' and their service providers' flexibility in reducing safety measures in order to compensate for profit losses, and thereby counteracts economic threats. Furthermore, the exceptionally high safety standards and rigorous safety legislation implemented in the petroleum industry can perhaps account for the stability in safety climate perceptions across measurement points. For instance, Dawson, Willman, Clinton, and Bamford (1988) investigated the impact of the newly established British Health and Safety at Work Act (HASAWA) on safety. The plants included in the study experienced neither an increase nor an expected decrease in accidents following the act, which were partly attributed

to the poor economic situation at the time. The recession was thought to even out the positive effects of HASAWA. Moreover, a qualitative study by Young and Blitvich (2018) investigated safety issues in two industrial plants that were under major financial threat. When the study was conducted, one of the plants was in the process of being shut down while the other was near liquidating. In contrast to former literature, the authors found that the safety performance did not deteriorate in either of the plants, even though the employees faced redundancy processes. Furthermore, both plants' safety performance was better than ever at the time of closure, which supports their claim of an improved safety performance. Interestingly, the findings in the Young and Blitvich (2018)'s study are comparable to our what the HSEQ managers described in our Study 1, although they measured performance and not safety perceptions. Thus, the studies support the assumption that the petroleum safety legislation may be strong enough to endure a recession without deteriorating safety.

Anyfantis, Boustras, and Karageorgiou (2016) claimed that the global recession in 2008 mostly affected the opportunity to buy new equipment, training and innovation. The HSEQ managers in Study 1 acknowledged that the company's buying power had declined and that there had been cutbacks on non-mandatory safety courses to save money. The fact that the companies are a part of a high reliability industry and have to follow strict legislation is a probable explanation as to why they only dismissed non-mandatory courses. This also indicates that the companies prioritize cutbacks in the right places to prevent weakening the safety onboard the vessels.

The safety laws and regulations governing the offshore activity in the Norwegian sector are particularly strict, and the companies in the Norwegian petroleum industry may have developed a strong and coherent safety climate, thus illustrating a ceiling effect where there is not much room to advance further. That is, contextual factors specific to the Norwegian petro-maritime industry may have moderated the potential relationship between

the industry's economic hardships and safety climate. As the sample was predominantly Norwegian and working on vessels operating on the Norwegian Shelf, this offers support to the assumption that the companies have developed a culture for a strong safety climate which may be highly robust when facing financial hardships and may have protected them from experiencing negative safety outcomes of the crisis.

Secondly, the fact that the petroleum industry is comprised by high reliability organizations may have protected the workers from experiencing any form of deterioration or weaknesses in the safety barriers caused by cost-cutting due to the recession (Reason, 2000). Furthermore, the implementation of the system approach on error and the principles of the Swiss Cheese model can account for a ceiling effect and thus the similar evaluation on safety climate in 2013, 2015 and 2017 (Reason, 2000, Reason 1995). Thus, applying several protective layers of safety barriers and maintaining barriers regardless of economic hardships may have protected the workers from harm and communicate to them that the safety is a priority in the organization. As a result, the companies demonstrate that their safety systems are resilient, effective and durable in a harsh economic climate. Thus, it also indicates that the recession does not weaken the most important safety barrier on the vessels; humans. Furthermore, it signals to the workers that workplace safety, including attitudes and compliance to safety practices, policies and procedures, is important and prioritized above competing productivity objectives, and thus contributes to a strong safety climate. This line of reasoning is also in line with Beus et al. (2016), who in their integrated safety model suggested that organizations that already have a strong safety climate are more likely to withstand changing circumstances and productivity pressure without letting it negatively affect their safety practices. Moreover, a safe workplace coincides with Weick's (1987, p. 118) notion of reliability as a "dynamic non-event", thus rendering safety invisible. Zohar (1980) points to characteristics of low accident-rate companies, such as open communication

links and frequent contact between workers and management, that may counteract the negative effects of a recession. The HSEQ managers stated that communication links between the maritime workers and the land organization was important, thus indicating that the shipping companies possess these characteristics. Moreover, Hofmann et al. (1995) demonstrated that the management's commitment to safety was important for maintaining a strong safety climate during a recession.

Contrary to the findings in the present thesis, Sønderstrup-Andersen & Bach (2017) found a negative development with regard to workplace safety following a recession. The authors measured safety outcomes with a pre-recession survey in 2006 and a follow-up survey in 2011 among a range of Danish companies, and examined the economic recession which started in 2008 and how it affected companies' preventive safety activities. The findings indicated that several of the preventive safety activities decreased after the recession. For instance, less companies had prepared accident actions plans and executed safety rounds as routine work in 2011 compared to 2006. They concluded that additional research is needed to investigate how a recession can impact companies' safety activities. Comparing the results in the present thesis with the ones presented by Sønderstrup-Andersen & Bach (2017) illustrates that differences in the safety outcomes measured and the context of a study may influence what inferences are drawn when attempting to answer the question of how economic hardships may influence workplace safety. For instance, it is fair to assume that an organization in the Norwegian petro-maritime industry is more likely than a randomly sampled Danish enterprise to exhibit the characteristics of a high-reliability organizations, and subsequently that the two organizations may differ in terms of how economic hardships affect their workplace safety.

The HSEQ managers in four different shipping companies in study 1 reported that the safety climate had improved in their companies in the period following the 2014 recession.

The follow-up analyses in study 2 partially supported this tendency, as there was a slight increase in safety climate scores specific to the shipping company level from 2013 to 2017. These improvement tendencies can be understood in light of how the HSEQ managers described that they worked with safety issues following the oil crisis. The HSEQ managers stated that they rewarded and supported safety-related behavior that were consistent with their safety policies, procedures and practices. For instance, some took advantage of using a safety coach who worked on the vessels in order to uncover safety weaknesses before injuries, adverse events and major accidents occured, and thus identified and corrected safety issues. The safety coach was a maritime worker who expressed a particular interest and motivation for safety issues and in making the vessels a more safe workplace. The informants also reported that safety had improved during and after the recession due to the fact that the market and competition were tougher. A harsher market meant that their safety records and vessels' and company's' reputation were especially important, as it affected their position when bidding for contracts from clients. They also argued that frequent visits from the top and middle management on the vessels, and close communication and dialogue between the land organization and the vessels contributed to improving the safety climate. They believed that these kinds of safety behaviors from the land organization convey to the maritime workers that they care about their workplace safety and hear their opinions regarding safety issues directly. Moreover, they received more safety reports on dangerous situations, actions or events than ever after the recession, which they took as a testimony of heightened safety focus and a strengthened safety climate. The safety coach and type of reports can thus collect information on both the absence and presence of safety. The procyclical effect perspective, which argues for a reduction in safety problems due to a economic decline, supports the managers' statements that safety has improved following the downturn (Sønderstrup-Andersen & Bach, 2017). For instance, a range of studies demonstrate that the rate of

workplace accidents and accident-reports can decline during a financial crisis, which indicates that safety is strengthened, and conversely that accident rates and accidents reports can increase when the economic climate is strengthened (Asfaw, Pana-Cryan, & Rosa, 2011; Boone & van Ours, 2006). The logic seems to be that a recession leads to high unemployment numbers, which then weakens the workforce and thus contributes to fewer accidents and accidents reports (Anyfantis et al., 2016; Boone & van Ours, 2006; Davies, Jones, & Nuñez, 2009).

The shipping companies reported that they experienced a decline in hiring of new employees due to the crisis, therefore, shared and team situational awareness offers a valid explanation as to why recession did not negatively affect the safety climate and why there were an small improvement in safety climate perceptions at the shipping companies (Endsley, 1995). As it is the more competent employees that is most likely to keep their job, this can contribute to vessels that have more experienced crew that know each other better, which further might enhance the workplace safety and safety climate. de la Fuente, López, González, Alcántara and Ritzel (2014, p. 84) found that accidents in the workplace decrease during a financial crisis and supports the idea of reinforced situational awareness and the healthy worker effect due to what they claim is a "natural selection" process, which leads companies to favor older and more experienced workers. Moreover, the authors argue that if companies are left with workers with more experience then it is less probable an accident will occur and it will lead to fewer accidents, which overall strengthens the safety. A stable workforce also indicates that the crewmembers on the vessels are familiar with each other, and thus research show that teams that know each other performs better than unfamiliar teams (Foushee, Lauber, Baetge, & Acomb, 1986; Goodman & Leyden, 1991; Watson, Michaelsen, & Sharp, 1991; Zenger & Lawrence, 1989). Moreover, heightened team performance may improve the workplace safety and thus strengthen the safety climate. To illustrate, Saus, Espevik and Eid

(2010) argue that the Sleipner-accident happened partly as a result of unfamiliarity among crewmembers, which then interfered their team situational awareness, for example by not detecting important cues. Overall, this weakened the safety on board the vessel and lead to an severe accident.

The analyses of safety climate at different levels in Study 2 revealed a slight increase over time in perceptions of safety climate level at the shipping company level only from 2013 to 2017, while no differences over time in perceptions of safety climate specific to the captain level or the client company level were found among the vessel employees. Although a stability or even an increase may be understood in light of factors such as strict safety legislations and a high prevalence of high-reliability organizations continuously working to improve safety, it is less clear why safety climate perceptions changed at one level and remained stable at the other two levels. One possible explanation could be that the oil crisis contributed differently to the motivation to improve safety at the different levels. Based on the HSEQ managers' own experiences of the recession as a period where the shipping companies had to increase their safety focus in order to win contracts in a tougher market, it is possible that the shipping companies increased their safety focus as a response to the toughened competition. The client company, however, being the buyers of transport services, did perhaps not need to increase their emphasis on safety following the oil crisis. Moreover, although the captains are likely encouraged by the shipping company to increase their safety focus in times when the company as whole is working to improve safety, the crew may still perceive the safety focus of the captains as more stable. The crew are likely to have more frequent interactions with their captain, and based on the descriptive statistics presented in Study 2 (see Table 2), it appears as though the safety climate scores specific to the captain were more favorable and characterized by less dispersion compared to the scores specific to the shipping company and client company.

Although perceptions of safety climate specific to the shipping company level improved from 2013 to 2017, no significant differences in mean scores were found between 2013 and 2015, or between 2015 and 2017. One reason may be due to the fact that organizational changes take time and therefore the result of the changes implemented to improve the workplace safety may be easier to observe over a longer time period than a shorter time period. The HSEQ managers stated that they worked on improving the safety following the oil crisis, by simplifying safety systems and making the systems more common sense and logical for the workers and less technical and academic. Further, that said that they continuously worked on promoting high quality safety attitudes and emphasizing to the workers why reporting is important. For instance, if the rate of change in safety perceptions following improvement efforts is steady, but rather slow, any effects may be more pronounced after four years rather than after two years. As the effect size for the difference between safety climate perceptions at the shipping company level in 2013 and 2017 was very small, with partial eta squared indicating that year of data collection only explained 0.7 % of the variance in safety climate, it is also important not to over-interpret the magnitude and importance of the difference.

Recession, safety climate and job insecurity

Although we have mainly focused on job insecurity and safety climate as separate outcome variables of interest following an economic crisis, our theoretical framework also indicates experiencing heightened job insecurity may be linked to lowered perceptions of safety climate. This assumption was further supported by the negative correlations between job insecurity and safety climate reported in Study 2 across both measurement points where both variables were included. Job insecurity has been negatively associated with safety outcomes and with experiencing more accidents and underreporting (Byrd, Gailey, Probst, & Jiang, 2016; Probst, Barbaranelli, & Petitta, 2013). Boone, van Ours, Wuellrich and

Zweimüller (2011) claimed that an economic recession is bad for safety because employees underreport out of fear of losing their jobs and consequently the companies do not have enough people working with safety during the recession. In the aftermath of the helicopter-accident at Turøy in April 2016, an anonymous pilot expressed worry that it was harder to admit to not feeling fit for flight, as well as a difficulty with performing their best, during the oil crisis (Matre, Larsen-Vonstett, & Braaten, 2016). Byrd et al. (2016) found that temporary workers who experience job uncertainty displayed more negative safety-related outcomes compared to permanent workers. For instance, the workers exhibited less safety compliance to procedures, less safety knowledge and safety participation in the company. Palali and van Ours (2017) found a tendency to underreport workplace accidents when unemployment is high. It might be, then, that economic downturns may have an indirect negative impact on workplace safety, through increasing employee perceptions of job insecurity. Overall, it seems probable that an investment in reducing employees' perceptions of job insecurity may also be beneficial for workplace safety in general.

Implications

Due to the fact that job insecurity is linked to many negative outcomes like lower job satisfaction, higher levels of workplace injuries and accidents and a negative effect on workers' health and well-being (Probst & Brubaker, 2001; Quinlan & Bohle, 2009), organizations should implement measures to decrease job insecurity. In addition, open and honest communication from the management during uncertain times could strengthen the psychological contract between employer and employees and in turn decrease job insecurity (Keim et al., 2014). Former research has also suggested that social support (both at work and outside of work) can buffer the impact of psychological strains, including job insecurity (Lim, 1996). However, job insecurity is difficult to reduce, and a more realistic goal for organizations may be to stabilize it and keep at an acceptable level (Abildgaard, Nielsen, &

Sverke, 2018). Taking on this challenge of managing employee job insecurity, recent intervention studies have reported promising effects of organizational interventions consisting of information sharing, feedback and supportive leadership (Abildgaard et al., 2018; Barrech, Seubert, Glaser, & Gündel, 2018). Organizations may get healthier, happier workers, as well as less work-related accidents by implementing these measures during times of economic instability. Moreover, it is important to identify the predictors of job insecurity in order to reduce job insecurity perceptions (Keim et al., 2014). Thus, by identifying recession as a cause of job insecurity, our results may contribute to the field of predictors of job insecurity.

Our studies highlight that it is possible to maintain a healthy safety climate following harsh economic times. Furthermore, maintaining a strong safety climate is important because of its negative relationship to injury rates (Nahrgang et al., 2007). We presented several possible explanations as to why the safety climate in the shipping companies managed to withstand the negative effects of the recession. However, as we were unable to test these proposed mechanisms, future research should therefore try to clarify the relationship between economic crisis and safety climate perceptions. These studies provide a starting point for this type of research, which ultimately can benefit organizations with learning how to strengthen and maintaining a strong safety climate in a harsh economic climate.

Lastly, the Norwegian petroleum industry is also facing other challenges in the years to come that may require substantial changes and thus influence employees' perceptions of job insecurity and safety. For instance, politicians heavily debate whether the Norwegian petroleum industry is viable, given its negative environmental impact. Furthermore, it will be interesting to see whether the industry will follow the same transformation as the fishing industry, where developments in technology have contributed to increased production, but also a decline in vessels and workers in the last years (Aadland, 2016). Overall, the Norwegian petroleum industry and petroleum related industries may face an uncertain future

with substantial changes, highlighting the need for a sustained awareness on maintaining a strong safety climate and managing employees' job insecurity.

Strengths and limitations

A strength of applying a mixed method design, is that we obtained detailed information about how the HSEQ managers in different companies experienced the effects of the recession on safety climate and job insecurity, and were able to use this information to aid our interpretations of the survey data from the same period. The interviews provided us with a deeper understanding of safety climate and job insecurity than if we had only had the surveys analyses. Furthermore, the two-study design allowed us to compare the two data collections and look for discrepancies and similarities. The qualitative and quantitative approach complement each other and provide the researcher with a more comprehensive picture of the issue (Krumsvik, 2014; Lund, 2012).

We conceptualized 2013 as a pre-recession measurement and 2017 as a amid/post-recession measurement in both studies. Late 2014 was considered the start of the crisis, and hence 2015 was the amid-recession measurement. Although the crisis started in late 2014, it does not necessarily mean that the companies were affected immediately. The market is generally characterized by fluctuations and the shipping companies have often ongoing long-term contracts, and therefore it is possible that the workers did not perceive changes in safety-related outcomes and job insecurity until 2015/2016. However, the informants in Study 1 supported our initial understanding of 2013 as a pre-recession measure and 2015 and 2017 as amid and amid/post-recession measures, respectively, strengthening our confidence in the classifications of the measurement points.

Study 1 does not touch upon topics that are considered very sensitive or distressing to talk about. However, we learned that reputation is important in the maritime industry, and that the shipping companies must perform well on safety measures to obtain contracts. A

limitation of Study 1 may therefore be that it can be difficult for a HSEQ manager to admit to breaches of safety practices, even though full confidentiality was ensured the participants. However, we believe the informants were sincere about the companies' challenges and do not consider dishonesty to be a major problem.

Study 2 is based on correlational data, and it can be problematic to draw causal links between the recession in the petroleum industry and the variables. For instance, Burchell (1999) writes that it is difficult to demonstrate evidence of a relationship between time point and job insecurity as there are many possible sources and moderators. The same issue applies for safety climate, which may be affected by a range of factors other than the economic hardships in the industry. However, correlational research is valuable and lay the foundation for further research and relationships to be examined.

Low response rates can be a problem when administering surveys. Baruch and Holtom (2008) studied the response rates in organizational research over a five-year-period and found an average response rate of 52,7% in studies that collected data from individuals. The response rates in our study are therefore below average at 45.1% (2013), 24.7% (2015) and 30.2% (2017). However, Mearns, Flin, Gordon, and Fleming (1998) obtained a response rate of 33% in their study of safety climate on UK offshore installations. Mearns, Whitaker, and Flin (2001) applied benchmarking strategies for monitoring safety climate. The surveys were sent to nine oil and gas installations in two consecutive years. The response rates varied from 10% to 80%, across the different installations and years. This large gap in response rates was problematic and may be due to different distribution of the questionnaires. The researchers had given specific instructions on how the surveys should be administered, but they were not present at the installations to oversee that it was done correctly, and the distribution techniques varied. This may also be the cause of our differing response rates.

Study 2 used self-report measures. A potential problem with self-report measures is the social desirability bias; "the basic human tendency to present oneself in the best possible light" (Fisher, 1993, p. 303). This might distort the results, for instance, if respondents were worried that giving negative answers would have negative consequences for the vessel and the shipping company. However, the surveys were anonymous, and the participants were ensured full anonymity and confidentiality. In addition, the introduction page stressed that the client company and the shipping company would not see the answers. We assume that the respondents answered truthfully, since it will benefit the employees so that factors which negatively affect their workplace safety can be identified. While there are some limitations concerning the self-report measures in Study 2, it is still a valuable method to gain information as it is versatile and easy to use and distribute (Bordens & Abbott, 2005). Moreover, it would be hard to measure subjective perceptions of job insecurity and safety climate without using self-report measures.

The surveys were distributed to those that worked on board vessels in the petroleum industry, but it may be that their perceptions differed from people working in other branches of the industry, for instance on the platforms or the land organization. Thus, it is challenging to generalize the findings to other populations. In addition, it is possible that the informants in Study 1 may be partisan or biased as they work exclusively with safety matters, and not production where the production pressure might be perceived more strongly. Future studies are needed to map potential differences between different branches and workers in the petroleum industry. Further, it might be that the specific context influences the results through possible moderators. As discussed above, the petroleum industry is characterized by many regulations and a strong safety focus, which puts it in a unique position. The comprehensive legislation might work as a moderator on the relationship between recession and safety

outcomes, and it is possible that studies in a less regulated industry might have produced different results.

Lastly, the majority of research that has examined safety issues in a recession context has mostly been done in industries that operate with construction or manufacturing, and not high reliability organizations such as the petroleum industry. Moreover, the focus in previous studies has mainly been on safety measured in number of accidents and reporting trends, and not safety perceptions. Overall, this makes the studies in the present thesis unique, and highlights the necessity for more research on this topic.

Future research

We focused on quantitative job insecurity in the present thesis, which corresponds with the focus of the majority of the existing job insecurity research. However, future studies should also investigate whether qualitative job insecurity is affected by a recession in the same manner as quantitative job insecurity. In other words, examine if economic turmoil is an antecedent of qualitative job insecurity as well. Lee et al. (2018) points out that a changing labor market adds new strains on employees. As automation increases and the need for human labor decreases, qualitative job insecurity might be more relevant to study as it focuses on a worry of losing job features. The field would also benefit from developing standardized scales for both quantitative and qualitative job insecurity.

A large body of research has explored the safety climate concept. However, it would be beneficial to further investigate the various safety climate dimensions and what promotes a healthy safety climate. It would also be interesting to uncover exactly how the shipping companies have managed to uphold their strong safety climates, and systematically map possible moderators of the relationship between a recession and safety climate. While we gained a lot of insight on safety matters from the HSEQ managers, it may be useful interviewing captains as well, as they are an important safety role model and have valuable

information about workplace safety issues. Given the authority the captains possess, they are more likely to gain support for safety issues than the crew.

In addition, it would be interesting to see the results replicated in other industries, both other HRO-industries and non-HRO-industries. By doing so, it could be possible to identify if of our results are specific characteristics of the recession in the petroleum industry, or if they are general outcomes of a recession.

As far as we know, our study is among the first to investigate how an oil crisis relates to offshore maritime workers' perceptions of safety climate and job insecurity. More research is clearly needed to fully understand the relationships between the variables, and to further establish the effects of an economic recession on safety climate and job insecurity. Our studies are purely correlational, and longitudinal studies following a cohort of workers over time, while controlling for other variables hypothesized to affect the outcomes, would give more accurate results and could also uncover the underlying mechanisms of the relationships (Mucci et al., 2016).

Conclusion

Maintaining workplace safety and employee well-being is vital for all organizations, and perhaps especially important for high-reliability organizations that face a continuous threat of large-scale accidents with detrimental outcomes in their day-to-day operations. However, it is far from given that organizations are able to maintain their employees' experiences of safety and security in times of great economic strain. The 2014 oil crisis put a great deal of economic pressure on companies in the Norwegian petroleum industry and petroleum related industries, like the shipping companies under study in the present thesis. The 2014 recession thus provided us with a natural experiment that allowed us to compare perceptions of job insecurity and safety climate prior to and following the onset of the recession among workers in shipping companies likely to have been affected by the recession.

Overall, our results suggest that to the extent that the recession inflicted increased economic strains and production pressure on the shipping companies, the companies were able to mitigate any potential negative impact this could have had on the safety climate onboard the vessels. In light of the theoretical framework of high-reliability organizations and the explanations provided by the HSEQ managers in the respective shipping companies, it appears that high-reliability organizations are resilient and may be able to withstand economic hardships without deterioration of their workplace safety, through maintaining a focus on prioritizing safety concerns over immediate productivity concerns. At the same time, our results indicate that the employees experienced substantially higher levels of job insecurity following the recession, which is closely linked to employee well-being and poorer safety outcomes. Seeing as the job market is moving toward more automation and an increase in temporary jobs, job insecurity may seem inevitable following a large-scale recession. As argued by Lee et al. (2018), job insecurity is an issue that influences the well-being and safety of workers, and reducing job insecurity is therefore an important issue. The predictors of job insecurity have to a great extent been identified, and implementing measures that diminish the negative consequences should prioritized.

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Appendix A - Template analysis

Main themes:

1 Recession

2 Safety climate

3 Attitudes towards safety work

4 Safety practices

5 Attitudes towards reporting

6 Safety training

7 Job insecurity

1 Recession

- 1.1 Crisis in the oil- and gas-industry
- 1.2 Time and duration
- 1.3 Restructuring and downsizing process

2 Safety climate

- 2.1 Generally good
  - 2.1.1 Higher focus on safety during and after the crisis
    - 2.1.1.1 Tougher market and competition
  - 2.1.2 Variations in perceived safety
  - 2.1.3 Good statistics
    - 2.1.3.1 Low LTI-statistics
    - 2.1.3.2 Good communication and dialogue between the land organization and the vessels
    - 2.1.3.3 Visits on board vessels
- 2.2 Management system
  - 2.2.1 Simplification of the management system
    - 2.2.1.1 Implement a system that is straightforward, user-friendly, and logical
  - 2.2.2 Challenges
    - 2.2.2.1 Different customer requirements and degree of involvement in