Who's the Boss in Risky Business? Clarity around responsibility for decision making becomes critical during a crisis

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This research uses a case study of the Ocean Ranger (OR) oil rig disaster to explore how the lack of clarity regarding decision makers contributes to crisis. The paper contributes to the literature by applying sensemaking and social construction theory to explain the OR disaster. While prior research focused on specific topics related to lack of clarity such as virtual work environments or communications, this study adds to the literature since it encompasses a wider lens by considering the impact of how the distributed nature of the offshore oil sector compounded by lack of clarity around the identity of decision makers, multiple companies involved and overlapping American and Canadian regulations all contributed to the OR disaster.

Keywords: Sensemaking, Social Construction, Crisis, Offshore Oil Industry

INTRODUCTION

Long shifts, highly combustible materials, floating platforms filled with heavy equipment hundreds of miles off coast: in the offshore oil and gas industry, risk cannot be avoided so it must be managed. Oil and gas extraction industries account for over 74% of fatalities in all private mining industries (Bureau of Labour Statistics, 2015) and within that sector offshore drilling has the highest levels of risk relative to other offshore activities (Duffey and Skjerve, 2009). Using a case study, this paper considers virtual team communication processes in a high-risk situation. This examination of an offshore oil rig disaster off of Canada's East Coast, the Ocean Ranger (OR), suggests the ability of external cues to influence virtual team members' plausible, retrospective accounts of role clarity and decision-making processes as they unfolded in a high-risk situation.

Many people are familiar with the Piper Alpha disaster in 1988. More recently, the British Petroleum oil rig fire off the coast of Texas and the Cougar helicopter crash on route to an offshore oil rig off Canada's East Coast, illustrate the high risk associated with working in today's offshore oil industry. In a review of major oil industry failures and engineering practices, Moan (2004) purports that the main causes of such structural failures are due to human errors and omissions and cause up to 90% of the failures of buildings, bridges, and other engineering structures including oil rigs and drilling platforms

(Duffy and Skjerve, 2009). A human error problem can be viewed from a person perspective, or a systems perspective.

While many factors contribute to the occurrence of any one tragedy, this case study focuses on role clarity and decision-making processes in a high-risk situation. Using the Ocean Ranger (OR) as a case study, we explore how the lack of clarity with respect to the decision makers contributed to the disaster. Through this case study, we explore differing perspectives regarding the location of decision makers: onshore, offshore or a combination of both, depending on the type of decision. We use sensemaking and social construction theory to examine how the lack of clarity around the identity of the decision makers in a distributed work environment contributed to the OR disaster.

This research has implications for how organizations establish and communicate decision- making responsibility and authority. The findings from this study illustrate the level of confusion regarding responsibility for decision-making in the offshore oil sector. It is important for organizations, particularly in the offshore oil sector, to develop a strategy whereby organizational structure and decision-making are clearly established and communicated. Clarity around responsibility for decision-making becomes critical during a crisis. Indeed, avoidance of a disaster is highly dependent on having organizational responsibility and decision-making authority clearly delineated. It is important to conduct this study since we continue to see tragic accidents occurring in the offshore oil sector. While there are numerous studies regarding various disasters, there is a paucity of research focused on confusion about identity of decision makers impacting how workers respond in a crisis situation in the offshore oil industry.

CONTEXTUAL BACKGROUND

On Valentine's Day, 1982, a storm raged off the shores of Newfoundland, Canada. One hundred and seventy nautical miles east of St. John's, Newfoundland's capital city, waves higher than 20 feet beat against the "unsinkable" OR oil rig. As the storm unfolded the rig began to tip. It later capsized, causing the entire 84-man crew to lose their lives. When the OR sank to the bottom of the Canadian North Atlantic on February 15, 1982, it was the largest self-propelled semi-submersible offshore drilling unit in the world (Furey, 2017).

The province of Newfoundland and Labrador is a northern jurisdiction in the North Atlantic, and the most easterly of the 13 jurisdictions in Canada. The province has a significant offshore oil and gas industry; indeed, oil revenue accounted for 28% of the provincial government's total revenues in 2014 (Province of NL, 2017). The Hibernia oil field is located about 200 miles east of St. John's, which is where the OR was located, and is responsible for the majority of the province's oil production (Province of NL, 2017). St. John's was the operations center for the OR, although the oil rig itself was owned by the American organization Ocean Drilling and Exploration Company (ODECO); therefore, some of the decision-making power was with the head office of the corporation in New Orleans (Furey, 2017).

Operations within the context of the present study were overseen by managers and operators of deep water offshore oil rigs in the ocean off Newfoundland. As such, communication and collaboration between dispersed teams both onshore and offshore were critical elements of task execution. To accomplish this, the OR personnel were organized into integrated virtual teams to provide expertise across functional areas, and to exchange information that would assist with meeting team goals and problem solving. As a virtual team on which individual onshore and offshore workers had their own independent tasks, communication of knowledge and shared meaning were critical to effective collaboration and task executions (Cramton, 2001; Qureshi et al., 2006). The organizational structure in place at the time of the tragedy is depicted in Figure 1.

FIGURE 1
HIBERNIA/OCEAN RANGER ORGANIZATIONAL CHART
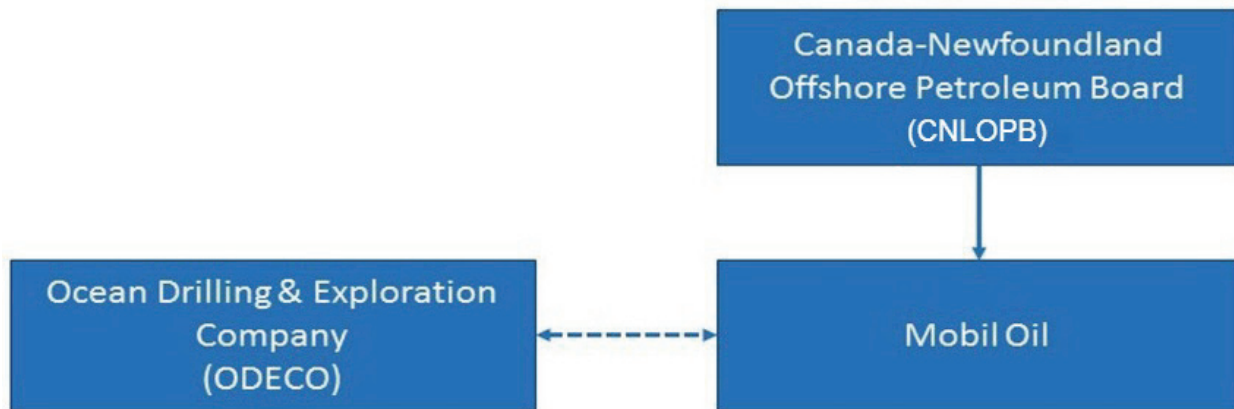
While there were several key underlying causes leading to the sinking of the OR, this case study focuses on the implications of the lack of clarity concerning the identity of decision makers. The next section provides a review of the relevant literature. The third section describes the research methodology. The fourth section presents the findings. The fifth section discusses and analyzes the findings, and the final section includes conclusions and potential areas for future research.

LITERATURE REVIEW

The main theoretical underpinning for decision making responsibility in crisis situations, adopted for this research, is based on the social construction theory of Berger and Luckmann (1966). This theory forms the source of thinking around this explanatory decision-making framework. Social construction theory posits that individuals continually and jointly construct the social world or cognitive schemes, which then become the reality to which they respond (Berger and Luckmann, 1966). Social construction theory is based on the proposition that social reality is constructed and embedded into the institutional material and structure of society.

Weick's sensemaking (1995) forms the theoretical framework for the analysis. In crisis situations, reality become indistinct, and it is the breakdown of socially constructed meanings during a crisis that is a fundamental element that leads to disaster. An explanation of socially constructed reality and accountability may be acceptable in a non-crisis situation (Weick, 1993b); however, it is problematic in a crisis situation because time pressures propel workers to assume that the problem will somehow be resolved. Consequently, crisis contingency plans are not triggered early enough and no one accepts responsibility because of the delay in recognizing reality or accountability. Sillince and Mueller (2007) studied conditions under which team members reframed responsibilities as projects began to fail. In crisis situations, such re-framing makes it difficult to identify the people responsible for crucial decisions during and after the crisis. Weick (2001) defined sensemaking within organizations as systems in which organizational members check with one another regarding the legitimacy of reality, and consequently, validate the required action. As proposed by Weick (1993b): "The basic idea behind sensemaking is that reality is an ongoing accomplishment that emerges from efforts to create order and make retrospective sense of what occurs" with people trying to make things reasonably accountable to themselves and others (p. 106). Weick (2001) used the analogy of cartography to describe the sensemaking process. Maps are used to help explain reality. Individuals compare their maps with those of others to "carve out a momentary stability in this continuous flow" (Weick, 2001, p. 9).

While there is no single agreed to definition of sense making, there is an emerging consensus that sensemaking can be defined as the processes by which people endeavour to understand ambiguous,

equivocal or confusing issues or events (Brown, Colville, and Pye; 2015; Colville, Brown and Pye, 2012; Maitlis, 2005; Weick, 1995).

According to Helms Mills, Thurlow and Mills (2010), the foundational properties of sensemaking stem from Weick's studies of The Mann Gulch fires (Weick, 1993) and the Tenerife plane crash (Weick, 1990), which illustrated how small separate failures can contribute to major disasters. In times of crisis, people rely on what is familiar and plausible to them. Weick (1995) contends that sensemaking entails understanding how social psychological processes contribute to crisis rather than concentrate on the crisis itself. Ultimately, the sensemaking concept is based on understanding how different meanings can be attributed to the same event.

Mills and O'Connell (2003) explain that Weick's (1995) sensemaking framework has been employed to study of various organizational crises such as the Union Carbide gas leak at Bhopal (Weick, 1988); an oil spill by Union Oil (Gephart, 1984); a fatal pipeline explosion (Gephart, 1993); as well as the Challenger disaster (Starbuck &Milliken, 1988). Fundamentally, sensemaking can be thought of as an interpretation of events that have already occurred. In other words, sensemaking encompasses a retrospective account of events (Helms Mills, 2003). It is paramount that we gain a better understanding of the social psychological processes that often result in crisis unfolding (Helms Mills, 2003).

Weick's sensemaking framework has also been extended to include linkage to the impact of power, activities and rules (Helms Mills, 2003). Mills and O'Connell (2003) contend that sensemaking is influenced by the relative of power of certain actors compared to others who may be involved in a crisis situation. Helms Mills, Thurlow and Mills (2010) maintain that individuals make sense of their environments in the context of power relations in the broader social environment of power and privilege. Indeed, critical sensemaking considers the impact of formal and informal organizational rules on how individuals make sense of crisis situations.

Role clarity can be either objective, in which there is a material presence or absence of adequate role-relevant information related to quality of access and information available, or subjective, in which the incumbent feels they have as much or not as much role relevant information necessary to perform their job well (Lyons, 1971). Decision makers are central to management of risk on offshore oil rigs (Aven et al., 2007). Depending on the nature of the decision, the decision maker could range from company level, to government, to international bodies. As a result of the wide scope of potential decision-making contexts and the need for different decision supports in each context, we bound our scope of analysis to decisions made to manage risk in the midst of a crisis on an offshore oil rig, the OR. Having a clear understanding and high knowledge of each worker's and manager's role is critical to the effective operations of a collaborative work environment. Hutchins (1996) and Weick (1993b) define transitive knowledge, or the ability to know each person's role in the group, as distinct from common knowledge, knowledge redundancy, and transactive memory. Members involved in a collaborative effort who do lose this 'virtual role system' or lack the ability to know "who does what" become less cohesive and run the risk of group disintegration (Weick, 1993b).

Similarly, Cecez-Kecmanovic and Dalmaris (2000) stated that sensemaking involves processes of perceiving, believing, interpreting, explaining, predicting, and acting both individually and collectively in a given organizational setting. Similar to Weick's (1993b) "truth" of reality, Pugh and Hickson (1996) concluded organizational members develop a "generic sensemaking" whereby individuals differ or concur, resulting in a sense of organization. Both Weick (1993b) and Pugh and Hickson (1996) perceived organizations as sensemaking systems.

According to Weick (1995) there are "at least seven distinguishing characteristics that set sensemaking apart from other explanatory processes such as understanding, interpretation and attribution" (p. 17):

1) Identity theory: Sensemaking is grounded in identity construction with the notion of self being constantly redefined by individual image of the self, which is formed by how individuals act in and interpret the world.

2) Retrospection: Individuals constantly look back at experiences to make sense of what took place at that time. Schutz (1967), Pirsig (Winokur, 1990), and Hartshorne (1962) all observed that people only know what they are doing after they have looked back at past experiences.

3) Construction of reality: Another aspect of sensemaking is the enactive of sensible environments or the construction of reality. Weick (1995) used work enactment to describe this characteristic. People often produce the environment they face (Pondy and Mitroff, 1979). Weick (1995) suggested "people or organizations act and create the materials that become the constraints and opportunities they face" (p. 3).

4) Social activity: Yet another aspect of sensemaking is that it is considered a social activity contingent upon others.

5) Ongoing: Sensemaking is also ongoing, meaning it never stops.

6) Focused on and by extracted cues: It is focused on extracted cues that are simple familiar structures and are the seeds from which people develop a larger sense of what may be occurring.

7) Driven by plausibility rather than accuracy: The final characteristic of sensemaking is that it is driven by plausibility rather than accuracy. Weick (1995) contended accuracy is good, but not necessary. The process of sensemaking is simply driven by a good story.

Weick (1988) contends that crisis are less likely to become serious if they are understood more quickly he argues that if we understand the process of sense making during a crisis then it is possible to prevent a larger crisis from as a result of more effective management of small crisis. Weick argues that actions as a result of sense making play a key role in the unfolding of the crisis and consequently it is important to understand the process better if organisations are to manage and prevent it. Weick (1988) goes on to state that small events or sometimes carry forward and in combination or in conjunction with other events overtime can result in an environment where very serious a failure.

Although Weick is the authoritative voice on sensemaking with his seminal work contained in two volumes (Weick, 1995, 2001), Pugh and Hickson (1996, p. 120) described his sensemaking work as "rolling hindsight" (p. 65) because it was based upon other researchers' secondary data re-analyzed by Weick. Parry (2003) concluded that although Weick produced eloquent, intuitive, and well referenced work, a body of critical work on the subject was not produced. For the most part, Weick reanalyzed other scholar's data, primarily from Porac et al. (1989) and Shrivastava (1987). While there has been considerable research using sensemaking to analyze decision-making in a crisis, there is minimal research on crisis decision-making in a distributed environment with multiple American and Canadian companies operating in the high-risk environment in the offshore oil sector.

METHODOLOGY

The methodology for this research is a case study comprised of a documentary review of the Royal Commission Inquiry on the Ocean Ranger Disaster (RCORD) and semi-structured interviews with 37 oil rig employees ranging from managers to workers on the rig. The RCORD inquiry was conducted in 1983-84 and the interviews were conducted in 2008 to ascertain the sector's current safety culture.

Since the objective of the present study was to explore the impact of the lack of clarity surrounding the identity of decision makers both during and after the OR disaster, a qualitative case study method was deemed suitable. The semi-structured interview data collection process provided the researcher with the lived experiences of participants from the oil and gas industry (Abusabha and Woelfel, 2003; Billingsley, 2004; Creswell, 2009; Moustakas, 1994; Mack, Woodsong, MacQueen, Guest, and Name, 2005) from which a wealth of information was gathered. Abusabha and Woelfel (2003) argued that the perceptions of individuals who are being interviewed allows the researcher to gather, analyze, report accurate information in a way free of bias and focused less on the interpretation of the researcher. Further support for qualitative studies is provided by Creswell (2009), who asserted that qualitative data provides a source of descriptive information that permits researchers to present results based on fact.

This case study commenced with a documentary review of the four volumes of the transcripts of the RCORD. The second phase of the case study was comprised of semi-structured interviews. Participants were identified using the snowball selection method, an informal way of reaching the appropriate oil and gas workers. A primary concern with snowball sampling research is the quality of the data, in particular, a selection bias that might limit the validity of the sample (Kaplan et al., 1987; Van Meter, 1990), restricting researchers from generalizing from the particular sample (Griffiths et al., 1993). Since the aim of this study is primarily explorative, qualitative and descriptive, snowball sampling offers practical advantages (Hendricks, Blanken and Adriaans, 1992). The snowball method used in the study was initiated with several people from different positions and different companies in the oil and gas industry, increasing the likelihood that the interviewees were from different social groups. Participants were comprised of union, non-union, management, and non-management personnel from both offshore and land locations. Names of the participants are anonymous since all of those interviewed expressed concern about the publication of their remarks referent to their future employment. In total, of the 40 invitations issued, 37 agreed to participate in the semi-structured interviews. The interviews were recorded and transcribed. The transcripts were coded to identify main themes that emerged through the interviews.

FINDINGS

Documentary Review

In response to the OR disaster, the Federal Government of Canada appointed a Royal Commission to conduct an inquiry to determine the root causes of the accident. The following sections provide the findings of the Commission in relation to the role of lack of clarity with respect to the identity of decision makers played in the rig sinking.

The RCORD found that one of the factors contributing to lack of clarity regarding the identity of decision makers, relates to multiple and often overlapping accountability among the multiple organizations involved in Hibernia. Accountability aboard the OR was divided among marine and drill tasks. RCORD provides several examples of confusion over the responsibility for marine versus drilling operations. Rig operations were the responsibility of ODECO, while the operations that affected the oil well were the responsibility of Mobil Oil Canada (MOCAN). Rig and well operations frequently overlapped, and almost all decisions by one party within their sphere of responsibility required close consultation and coordination with the other party. This was especially true in emergency situations (RCORD, Vol. 2, p. 62). The senior representative of ODECO Canada onboard the OR on February 14, 1982, was Mr. Ken Thompson. His position of toolpusher at the time of the disaster was senior to all other ODECO positions on the oil rig, including the vessel master.

As established by the testimony, it was ODECO Canada's policy on the OR to employ marine personnel, aside from the master. The marine crew consisted of individuals from within the industrial personnel force who held the Merchant Mariner's Documents (MMD), which is a Merchant Marine Credential issued by the U.S. Coast Guard. In other words, individuals were primarily employed on board the OR from specific industrial capacities such as toolpusher (the foreman who supervises drilling operations on an oil rig), driller, roustabout or the unskilled or semiskilled labourer, and electrician. It was only by coincidence that any of those individuals held MMD. This operational reality created some confusing and curious hierarchical anomalies aboard the OR. While it was anchored and drilling, all marine personnel were the responsibility of the master. The rig mechanic and crane operator would normally be accountable to the toolpusher, but as they were also ordinary seamen, they were accountable to the master. The Royal Commission emphasized the conflict in roles of crew members aboard the OR when they developed their recommendations:

> What is essential is that, when emergencies occur, all members of the crew should know
> in advance from whom they are to take direction. When lives are at stake there should be
> no question regarding who is in charge. One person should be clearly in charge of the rig
> at all times. The solution to be desired, and the one to be implemented as soon as it is

feasible to do so, is to place in charge of the submersible one who has knowledge and experience in both the marine and drilling aspects of the operation and who has the necessary leadership qualities (RCORD, Vol. 2, p. 167).

As revealed in the following statement from the RCORD, confusing regulatory responsibilities also contributed to the lack of clarity regarding decision-making:

"The day-to-day problems created by overlapping or inconsistent regulatory responsibility are magnified in times of crises when the heightened risk factor and unpredictability require a speed of response and flexibility of approach that are impossible in a structure that is made up of many loosely related parts. Perhaps the most important question emerging from a review of the regulatory process is the overall question of structural organization and jurisdiction. Identified as the key weakness in the offshore regulatory system of the United Kingdom by the Burgoyne Report, this controversial area has also been cited as problematic by a number of other countries. The specific safety problems created by overlapping or unclear division of responsibility are hard to predict, but it appears evident that such confusion may lead to conflicting patterns of enforcement, delays in preparing or amending legislation, and non-cooperation on the part of frustrated industry representatives" (RCORD, Vo3, p. 168).

The RCORD provided an example of lack of clarity and confusion regarding the role of who is in charge of the drill ships:

"All drill ships, whether anchored or dynamically positioned, are required to have a Master Mariner on board and in full command, although on an anchored drill ship, the senior drilling person may be in command during drilling operations. The command structure, however, is not always clear as it depends on whether the rig is drilling or in transit, and on the regulatory regime under which it is operating." (RCORD, Vol. 3, p.91).

While this decision-making anomaly contributed to lack of clarity regarding decision-making, it should be noted that it is permitted by the U.S. Coast Guard. The OR booklet of operation conditions specified that "while underway the person in charge shall be the Master, but while anchored on location for the purpose of drilling the person in charge should be the toolpusher, as permitted by the U.S. Coast Guard" (RCORD, Vol. 1, p. 29).

Furthermore, the RCORD found that the regulatory framework creates confusion about responsibility for decision-making:

"The main source of problems may not be the particular assignment of responsibility to COGLA (Canadian Oil and Gas Lands Administration) or elsewhere, but rather the confusion about where that responsibility lies. The same elements of confusion exist in industry, particularly among companies that are new to East Coast drilling, when it comes to determining the routines which must be followed in getting approvals and in complying with regulations in general. The present regulatory organization and structure are of recent vintage, and there seems to be little general knowledge in the industry about the organization and responsibilities of the various regulatory groups and the regulations themselves. There is no widely circulated source of updated information clearly delineating these lines of responsibility, or explaining current regulations, directives, and guidelines. This lack of systematic information is seen as an important gap in the smooth operation of the system" (RCORD, Vol. 3, pp 168-169)."

It is important to note that the state of confusion regarding responsibility for operations was not unique to the OR as indicated in the following RCORD witness statement:

> "Let me say first, that this history and set of operating conditions…. for the Ocean Ranger is not unusual. Indeed, it is conventional for the offshore drilling industry. Nonetheless, it is hard to escape the notion that, once drilling began on Canada Lands considerable ambiguity must have existed as to what management and regulatory authority dominated even for normal activities. For emergency operations there was room for even greater confusion" (RCORD, Vol. 4, p.11).

In summary, the RCORD found that the lack of clarity regarding responsibility for decision-making was attributed to overlapping regulatory frameworks, involvement of multiple companies in the drilling operation.

Semi-structured Interviews

The following sections reflect respondents' perceptions regarding the location of decision-making: on the oil rig, on shore or a combination of both on shore and on the rig depending on the situation encountered.

Location: Decision-making on the Oil Rig

The research found conflicting views were presented regarding the identity of the offshore decision maker. Several respondents felt that all decisions were made on the rig. When talking about where decisions were made, a respondent said:

> "The decision is on the rig. Everything is on the rig and it filters through all the information. We do not have direct contact with town unless somebody in the shore base contacts you and they want specific information."

Another respondent believed that the Offshore Installation Manager (OIM), the most senior manager of the oil and gas rig responsible for the health, welfare and safety of the personnel on board, had ultimate say. That worker stated:

> "They make all the decisions in the offshore. So, the OIM has ultimate say… he is the commander in chief in what is happening offshore, and he has got his leads that he leans upon, and they kind of give direction to the rest of the workforce, depending on what is happening offshore."

Meanwhile, another respondent offered a differing viewpoint with respect to which offshore positions had authority to make decisions. He said that while the OIM was the decision maker, this could change depending on whether the situation was a marine or non-marine situation (at sea or drilling):

> "The OIM makes the decision, but then you got a barge captain; he is on the marine side, and the stability of the rig – he is going to make a call on it…. Like in a marine case emergency, I would sooner have a barge captain – that fellow with his sea tickets– controlling that rig, rather than a fellow that came up through drilling rigs."

This worker supported the view that the decision-making process occurred on the rig, but the decision maker was identified as either the OIM or the barge captain, depending on the type of emergency that was unfolding.

Respondents provided examples of situations where the decision was made in the control room without indicating the identity of the decision maker. One respondent talked about a quick decision made in the control room in poor weather to allow a helicopter to land. He said:

> "Well, we made the decision that we had to bring the helicopter on deck. That was made in the radio room just in a split second. The installation manager (OIM) was up in the radio room keeping an eye on things should he be required to make a decision of any kind."

A distinction was made between quick, temporary decisions versus permanent decisions. One respondent explained:

> "Decisions to rectify stuff on the rig are made on the rig if it is only a temporary fix then it usually goes higher…everybody puts their input into it, and then they will come up with a decision."

The discussion by the worker indicates that decisions that are temporary or that cannot normalize the situation are discussed further with higher management. On the other hand, quick fix decisions are made on the rig at the time of the incident.

Furthermore, decisions on the rig are often influenced by the type of problem encountered. For example, mechanical problems are dealt with by the mechanical department. As a respondent explains:

> "Anything in the mechanical department…usually, it all comes to us. Anything on the drill floor happens… it is all mechanical gear anyway, and that usually falls back on the engineering department and we make the decisions."

The worker provides support for the decision-making required on the drill floor being handled by the mechanical department and the OIM being updated later.

Location: Decision making on Shore

Several respondents identified the decision-making location as St. John's, which is known as shore base and is often referred to by workers as shore, land or beach. An offshore worker respondent, who had also worked in the offshore in the OR days, felt that more decision-making today takes place in St. John's (shore base). He stated that "back in those days, the decisions were made on the rig. It is the complete opposite now. Nothing… no decisions are made on the rig anymore" unless management on the rig ignores the official rule. This worker discussed the night of the OR disaster when he was working on the SEDCO 706, a semisubmersible rig which was drilling 8.5 miles (13.7 km) from the OR rig, as a radio operator. He explained how the company man or the oil company's employee went to the radio room, where the decision-making took place. He felt that some management still follow this practice, using logic and dealing with the situation in the radio room. Discussing the decision-making aboard his vessel then, and comparing with decision-making today, the former worker stated:

> "...a prime example is the night when the Ocean Ranger went down – the company man came right there and he stood behind me, and all the decisions were made right there in the radio room as to what was going to happen, what boats were going anywhere, what helicopters were flying. Everything was done right there in the one spot."

Another respondent concurred that the decision-making was centralized, and that shore made the decisions. He noted:

> "Regardless if they got to get materials or they got a problem with a unit or anything else, we will go to our boss. He will check with the supervisor; the supervisor usually checks onshore. If we got a problem or whatever, they make the decision onshore and we basically just concentrate with the people offshore…."

Similarly, another respondent also felt that shore made the decisions. When talking about a friend who is an OIM he said:

> "He has been a Master Mariner for years. He is very good with people. But the problem is that they are puppets for one or two that is running the show in town, and they know that themselves. Like this guy said to me, I am in a position of authority with no authority."

A respondent felt that decision-making regarding expenditure of money on equipment meant going to the employer and asking for approval. He stated, "we talked about money like that but we have to go to people who were paying for this equipment …?" This worker provides support for a case where money is the determining factor for when shore personnel make the decision. In other words, if significant dollars are involved, rig personnel defer to St. John's for decision-making.

Decision Making in a Distributed Environment
The interviews also provided support for the perception that decision-making jointly involved both locations, depending on the type of decision. One respondent differentiated responsibility by location as dependent on the type of problem encountered. He believed the OIM was in charge of the decision-making on the rig, and shore was contacted for longer events. He said:

> "Most of it I would say the OIM – he certainly makes the majority of the decisions. For some events which are very long and drawn out, he may consult with people on the beach, but it is still his decision."

Several respondents provided support for the involvement of shore personnel in the decision-making process in more complex situations. One respondent felt that minor decision-making was handled by the rig and more serious situations involved communication with shore. He said:

> "So, if it is something fairly major, the control room gets involved and talking back and forth to town; but I guess if it is something minor… someone chopped their finger off or hurt themselves – not that that is minor – but it is handled on the rig and then probably reported to shore after. You kind of do what you have to do."

The worker's acceptance of "doing what you have to do" reinforces the belief that decision-making is not straight forward and workers do what is necessary, particularly when an immediate intervention is necessary. Clearly, the classification of decisions into tiers, or levels of seriousness, determines who makes the decisions.

A respondent explained that while quick and crisis decisions were made on the rig, operational decisions often involved shore. He said:

> "The bang-bang decision-making in an emergency situation…the initial decision-making has to be from the platform. Now when they are deciding on the repairs on a piece of equipment or something like this, there is consultation with town."

Another respondent felt that offshore is involved in decision-making from an operations perspective, and thus the decision-making was distributed. He said:

"…we usually involve offshore in those decisions as well, because we support the offshore. Offshore executes work from a maintenance perspective. The offshore runs the platform from an operations perspective. A lot of times they will want to have folks involved from onshore to get a better understanding rather than them making the decision that is going to affect production or affect, in their minds, safety. They draw upon onshore support to give them some guidance."

Furthermore, another respondent provided support for determining structure based on how far the event has escalated. That worker felt that situations that can be handled on the rig are handled offshore, but shore was always contacted so that they would be aware that a problem existed. The level of emergency determined the extent of involvement with the Coast Guard and other emergency response team members. He said, "It depends on the, I guess, the level of emergency."

DISCUSSION AND ANALYSIS

The RCORD provides strong support for the finding about clarity by showing confusion over the identity of the decision maker, compounded the level of confusion aboard the OR. A highly serious situation increased the need for a clearly identified decision maker. It is clear that the OR rig disaster was the result of a serious situation and that confusion and lack of clarity existed around the crisis events. According to the RCORD, prior to the OR disaster, confusion existed as to the structure for responsibility. In particular, there was uncertainty around the identity and location of the decision makers.

Using the seven properties of Weick's (1995) sensemaking framework combined with Helm Mills (2003) additional characteristics of power and authority, we analyze the findings from the documentary review and semi-structured interviews.

1) **Identity construction.** We make sense of an event based on who we are and the experiences that influence how we perceive the world (Mills, Thurlow and Mills, 2010). The workers interviewed identified themselves as offshore or onshore and depending on the perceived location of decision makers, this influenced their perception of who is responsible for making decisions. They also distinguish between oil rig workers and mariners as well as management and non-management personnel.

2) **Retrospective.** As Weick (1995) notes, action precedes sensemaking because we act first and then make sense of that action. Individuals' perception of current events is shaped by past experiences (Mills, Thurlow and Mills, 2010). For example, there were past close calls where the rig had listed (Furey & Rixon, 2018) and it did not result in a crisis. Consequently, it is likely that workers relied on this prior experience and did not recognize the seriousness of the situation.

3) **Enactive:** This property implies that we make sense of an event within the context of our environment. Sensemaking can be constrained or created by individuals' environment. In this case, the environment was high risk, management focus on productivity combined with confusion over the decision maker. Many of the OR workers did not have previous offshore oil rig experience. Consequently, they did not have significant prior experience to act on. Ultimately, they made decision based on their limited knowledge.

4) **Social:** An important component of sensemaking relates to the social process that led to the enactment. It includes our interactions with others who are present, virtually or physically. Rules and routines influence perceptions of appropriate conduct, but when there are not rules, individuals try to make sense themselves (Mills, Thurlow and Mills, 2010).

The interviews found that workers were unclear about when to get shore management or personnel involved in the decision-making process. This is compounded when workers move from distributed (a work environment that is virtual in nature with no face-to-face interaction) to non-distributed (a work environment where employees interact in a face-to-face manner) crisis situations; this causes workers to

wait before making decisions, often resulting in confusion over who should take responsibility. Indeed, distributed work situations may also contribute to decreased clarity around the crisis situation.

A lack of structure for responsibility was supported by interview respondents indicating conflict or a lack of clarity regarding the location and the identity of decision makers. The location of the decision-making process was either on the oil rig, on shore, or a combination of both. The decision maker list was long and varied with possible personnel from land and offshore including the OIM, the oil company president, and the oil rig worker.

The majority of respondents referred to decision makers not by position but by locations: they were referenced as personnel or someone from shore and someone from land. This indicates that participants can identify when a decision requires distributed-type communication, but they are unclear about who actually makes the decision. Several respondents referenced the distributed decision maker's identity as the marine captain in consultation with oil, weather, and ice personnel; a hierarchy of workers from shore and rig which could include the shore president if necessary; and the OIM/toolpusher, in consultation with shore personnel. A number of distributed decisions were identified: decisions around work from an operational perspective; decisions requiring guidance from shore regarding production; and work decisions around production in terms of drilling to full capacity.

The RCORD report also attributed some of the confusion and lack of clarity as to who the decision makers were to the complex and overlapping regulatory environment governing the offshore oil sector. The documentary review of the RCORD found that there were organizational anomalies regarding who was in charge. For example, depending on the location of the worker, a rig mechanic and crane operator would report to the tool pusher or to the master. The situation of certain workers having multiple reporting relationships causes confusion and can result in delays in making decisions. This is particularly problematic in crisis situations where time is of the essence.

As illustrated in the semi-structured interviews, there are conflicting views among informants regarding decision-making responsibility. In the examples cited, the majority of the decisions were made on the rig, and several possible rig decision makers were identified. Alternatives included the offshore installation manager (OIM), the OIM in consultation with the leads, barge captain/master, someone in the control room, and a rig worker. The OIM was identified as the key rig decision maker for operational and quick crisis prevention decisions, such as mustering of employees. Several workers, in addition to the OIM were identified as rig decision makers. The highest level of the hierarchy was where the OIM had to seek approval, suggesting centralized decision-making for significant decisions. Further support for centralized decision-making was provided by one participant's reference to the OIM as a "puppet" for shore. Someone in the control room also made quick "right away" type decisions. Specific decisions to rectify problems were made by personnel master and rig worker positions.

Several participants labeled distributed decisions as being more serious/fairly major or high risk. One worker identified quick and crisis decisions as those made on the rig and decisions for repairs as distributed type decisions. Another worker identified decisions to rectify a problem as being handled by the rig and temporary decisions as requiring involvement from higher management. Similarly, another worker indicated that longer events involved consultation with town. It is evident that time is a determining factor in the separation of distributed decisions and those made solely by rig personnel. Time pressures push the decision-making process to the rig.

1) **Ongoing**: To reduce uncertainty and ambiguity, we continually maintain an ongoing sense of the situation. The RCORD inquiry conducted in 1982 cited lack of clarity regarding the identity of decision makers as one of the key factors contributing to the disaster. Although the interviews were conducted more than 25 years after the disaster, all respondents were working for the same company and were still engaged in trying to make sense of what happened and why.

2) **Reliant on extracted cues**: According to the sensemaking framework, individuals choose to focus on certain cues and ignore others to support their interpretation of events. This is reflected in the fact that the OR had experienced previous lists and everything worked out (Furey & Rixon, 2018). Also, workers perceived that productivity took priority over safety

and consequently this influenced their decisions. Some workers also indicated in the interviews that rig personnel make quick, minor decisions o the rig, but that major decisions, particularly those involving large financial impact, were made on shore.

3) **Plausibility:** According to Weick (1995), sensemaking is largely driven by plausibility versus accuracy. Different meanings may be attributed to difference individuals to the same situation (Mills, Thurlow and Mills, 2010). The interviews revealed that there was a broad array of perceptions regarding responsibility with some believing major decisions were made on the right by various personnel, others indicated the decision making was made onshore, while others stated that decision making was split between onshore and offshore, depending on the seriousness of the situation and the potential financial impact.

4) **Power and authority**: In addition to Weiche's seven characteristics of sensemaking, Helms Mills extends the sensemaking framework by including power, authority and rules. The interviews revealed that workers' perceptions of decision-making authority were influenced by their perceptions of power and authority of offshore versus onshore personnel. Overall, the research found there is a perception that onshore management had relatively more power and authority than offshore management. For example, the interviews reveal that is was appropriate for rig personnel to make quick decisions, but that decisions which have a significant financial impact are made onshore.

In summary, given the disparity in participants' comments, there is a lack of clarity and transparency around the identification, location and type of decision, all of which determines the decision maker. The OIM was identified as a key decision maker for all locations, but it is clear that different workers have different theories on how the decision-making process occurs. Operational type decisions, including decisions regarding repairs, were identified as rig, distributed and shore type decisions. The lack of clarity around the decision-making process is understandable given the complex process which includes several different decision locations, decision makers, and types of decisions. The structure of decision-making on the rig is further complicated when the decision type changes from non-marine to marine, at which point the master/barge captain takes responsibility for the decision-making process.

The research found that the higher the seriousness of the crisis event, the less the clarity of the event. In crisis situations, issues become fuzzy; this leads to the collapse of socially constructed meanings or a breakdown in the sensemaking process, causing workers to become confused over who should take responsibility. While socially constructed responsibility may be acceptable in a non-crisis situation (Weick, 1993b), it is problematic in a crisis because often the crisis contingency plans are not triggered early enough and, consequently, no one takes responsibility. In addition, crises involving substantial loss of life, significant monetary loss, or damage to a company's image occurs so infrequently that organizational members have not constructed a strategy for dealing with such crises.

A lack of sensemaking in a crisis situation was further supported through findings from the RCORD. On the night of the OR rig disaster, the crew were contending with a wet control panel. Turning off the power to the ballast control panel was an effective and successful alternative for rig safety, but the crew were not comfortable with this alternative and decided to restore electrical supply to the panel. Disconnecting the power would have prevented further electrical shortages and would have prevented the more severe list. The crew stabilized the rig but later decided to start the engine. This action demonstrated a lack of sensemaking, which was a contributing factor to the sinking of the rig.

The model presented in Figure 2 is designed to explain the factors that contributed to the lack of clarity in a distributed work environment during a crises situation.

FIGURE 2
FACTORS IMPACTING CLARITY
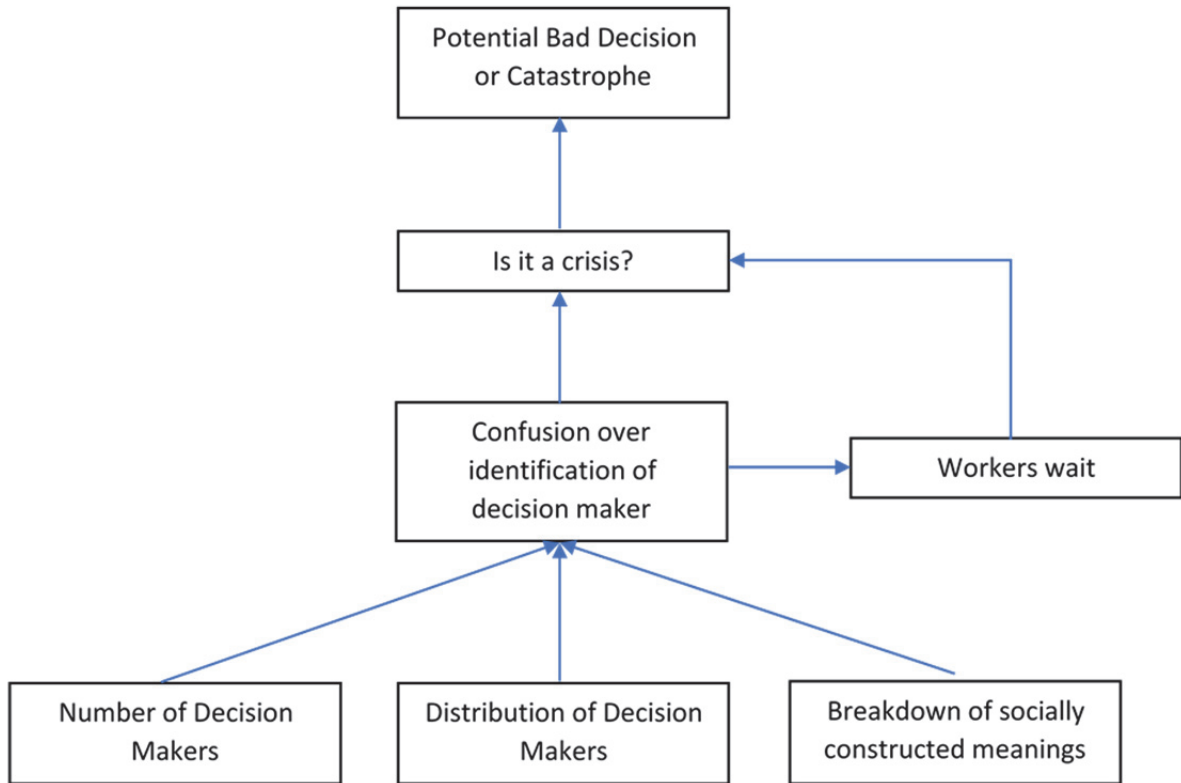
CONCLUSIONS

The objective of this research was to determine the role that a lack of clarity surrounding responsibility for decision-making had on the sinking of the OR. In particular, this study set out to explore the impact of location of decision makers on how workers responded to crisis. The RCORD found that as the OR tragedy unfolded, and the event become more serious, the less clear the crisis situation became. This finding was also confirmed through interviews with oil rig workers and managers. The interviews illustrate confusion regarding the location for various types of decisions. For example, some respondents believed all decisions were made on the rig, and even among those, there was a difference of opinion regarding who on the rig was responsible for making decisions. Other respondents indicated that decisions were made on shore, while some respondents stated that depending on the type of event, certain decisions were made on the rig and others on shore. The documentary review of the RCORD highlighted organizational anomalies as well as overlapping regulations with respect to reporting relationships.

The RCORD and interviews revealed that oil rig workers had formed varying and conflicting perceptions as to who made decisions. These perceptions were based on how they had socially constructed their organizational structure. Moreover, sensemaking was applied by the workers as they used prior events to construct their reality of the organizations and responsibility for decisions regarding situations of varying degrees of urgency. The main finding from the case study is the conflicting perceptions of decision makers as primarily on rig, on shore or a combination of on the rig and on shore depending on the situation. In addition to lack of clarity concerning the location of decision makers, the research found that certain workers had multiple reporting relationships and this certainly added to an already confusing situation.

This research contributes to the literature by applying sensemaking and social construction theory to explain the OR disaster. While prior research focused on specific topics related to lack of clarity such as virtual work environments or communications, this study adds to the literature since it encompasses a wider lens by considering the impact of how the distributed nature of the offshore oil sector compounded by lack of clarity around the identify of decision makers, multiple companies involved (American and Canadian) and overlapping Canadian and American regulations all contributed to the OR disaster. This research also provides insight for offshore oil companies regarding the importance of clearly identifying the decision makers for various types of situations.

Since this research is based on a sample identified through snowballing, it cannot be extrapolated or considered to be representative of the industry at large. However, the findings from the RCORD, corroborated through the in-depth interviews with workers and managers who had worked on the OR and other rigs with the same company, provides significant insight into lack of clarity surrounding identity of decision makers. The lack of clarity concerning decision makers was compounded by the distributed nature of the offshore oil rig combined with the time constraints associated with an emergency situation.

There are several fruitful areas for future research to extend the findings of this study. For example, it would be beneficial to conduct a similar study on other recent offshore disasters such as the Cougar Helicopter crash and the BP fire. Such studies would provide insight regarding any improvements in the industry with respect to the identity of decision makers.

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