How does a shift in the accident analysis process impact a learning culture

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Published
2021-09-24

Thesis Type
Thesis (PhD Doctorate)

School
School of Hum, Lang & Soc Sc

DOI
10.25904/1912/4352

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How does a shift in the accident analysis process impact a learning culture?

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Submitted in fulfilment of the requirements of the degree of Doctor of Philosophy

Date of Submission:
May 2021
ABSTRACT

The accident process is one of the foundation stones on which all other safety-related learning can be built. The post-accident treatment of the actors involved not only determines the level of learning gained, it can influence overall perceptions and attitudes towards both safety and the organisation. In recent years, there has been a growing appeal within academia for industry to adopt accident models with a greater capacity to understand complexity. Some scholars have also suggested that this requires a move towards a restorative justice approach. However, there is scant empirical evidence to show that the latter is more suitable for learning than an approach which uses retributive justice mechanisms. This thesis sets out to understand the question, ‘How does a shift in the accident analysis process impact a learning culture?’.

The research presented within this thesis was conducted within a construction organisation and specifically on a new build nuclear power station in the United Kingdom. The overall study has four key focus areas, each written as individual research papers. These four papers include a literature review of safety justice and studies on the impact of a retributive accident process, the impact of a restorative accident process and the influence of language within accident reporting. The studies carried out on the retributive and restorative accident processes used semi-structured interviews as a means to capture the raw data. The examination of the restorative accident process and its impacts was an ethnographic study over an eight-month period; this research approach helped to provide a deep understanding of the lived experience of the accident process. A separate study was carried out to understand the influence on the reader of the language and framing within an accident report. Data was gathered through a survey method.
The accident process is exposed to the same tensions and conflicting goals which exist within the organisational system. The need for alignment with stakeholders, both external and internal, influences the type of accident process used, the initial treatment of those involved and the organisation’s approach to accountability. This in turn affects how different actors respond following an accident and the level of learning gained as a result.

Though the primary goal of this thesis was initially to understand whether a change in the accident process affects the organisation’s ability to learn, its most significant scientific contribution is not in this area, but in challenging the understanding of the true intentions of the accident process and how the societal system has influenced this. Where the societal justice system is predominantly retributive, organisations require the means to defend themselves and the accident process is a manifestation of this. Prior to this study, the accident process was viewed only as a means for organisations to learn and hold those responsible accountable. Future studies of the accident process must now take into consideration the fact that its primary purpose is not for either of these but as a form of protection. The project and its findings make a methodological contribution to the study of accident analysis by showcasing the benefits of an ethnographic approach. The thesis also makes a significant theoretical contribution by creating a bridge between the theory of language and decision making and the theory of ‘just culture’. In addition to these scientific contributions, this research also makes a practical contribution to understanding the challenges of implementing a change to an accident analysis process. This thesis also considers the future work that could help expand on the learnings gained through this dissertation. Further analysing areas such as the influence of a countries’ justice system on accident processes within their domain, measuring success based on behaviours as opposed to outcomes, and analysing a change with an organisation where the accident process has transitioned from root cause analysis to system-based are all key areas for consideration.
STATEMENT OF ORIGINALITY

This work has not been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made within the thesis itself.

Derek Heraghty

May 2021
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ACKNOWLEDGEMENTS

Firstly, I would like to thank my supervisors, Drew and Sidney. This project would have been impossible without your guidance and expertise. Drew, thank you for your belief that I could deliver this project, your honesty, your dedication and your ability to help me shape my thoughts into academia-worthy ideas and conclusions. Sidney, thank you for your unlimited knowledge on the topic of just culture and for pushing me to produce material that was capable of adding genuine value to the scientific community and to industry.

To Martin Westbury and Laing O’Rourke: this project could never have occurred without your permission to do so and your full support in using both yourself and your workforce as the participants of this study. Thank you also to everyone on the project who participated in this study and gave up their valuable time to share their often very personal experiences. Without you, there would be nothing to analyse and no learning to be gained.

To the many who have influenced my career and my approach to safety, and in particular, John Green: your involvement and guidance at key stages of my career led me down the path I continue today. Your standing as a safety professional has acted as a guidepost for me and what I believe a safety professional should be.

To my parents, Tom and Delia. Thank you for setting me up for success by giving me the opportunities in life needed to fulfil my goals and more.

Lastly, and most importantly, thank you to Sammie for your unconditional support throughout this process and your constant motivation. To Amelia, thank you for just being you and the positive effect that has on me.
ACKNOWLEDGEMENT OF PAPERS INCLUDED IN THIS

THESIS

Section 9.1 of the Griffith University Code for Responsible Conduct of Research ("Criteria for Authorship"), in accordance with Section 5 of the Australian Code for the Responsible Conduct of Research, states:

To be named as an author, a researcher must have made a substantial scholarly contribution to the creative or scholarly work that constitutes the research output and be able to take public responsibility for at least that part of the work they contributed. Attribution of authorship depends to some extent on the discipline and publisher's policies, but in all cases, authorship must be based on substantial contributions in a combination of one or more of:

- conception and design of the research project
- analysis and interpretation of research data
- drafting or making significant parts of the creative or scholarly work or critically revising it so as to contribute significantly to the final output.

Section 9.3 of the Griffith University Code ("Responsibilities of Researchers"), in accordance with Section 5 of the Australian Code, states:

Researchers are expected to:

- offer authorship to all people, including research trainees, who meet the criteria for authorship listed above, but only those people,
- accept or decline offers of authorship promptly in writing,
- include in the list of authors only those who have accepted authorship,
- appoint one author as the executive author to record authorship and manage correspondence about the work with the publisher and interested parties,
• acknowledge all those who have contributed to the research, facilities or materials but who do not qualify as authors, such as research assistants, technical staff, and advisors on cultural or community knowledge. Obtain written consent to name individuals.

Included in this thesis are papers in Chapters 2, 3, 4 and 5 which are co-authored with other researchers. My contribution to each co-authored paper is outlined at the front of the relevant chapter. The bibliographic details or status for these papers, including all authors, are:

**Chapter 2: Paper to be submitted:**


**Chapter 3: Published paper:**


**Chapter 4: Published paper:**


**Chapter 5: Published paper:**

Student: Derek Heraghty

Supervisor: Andrew Rae

Supervisor: Sidney Dekker

Chapter 2 contributor: Hugh Breakey
REFLEXIVE STATEMENT

For the reader of this thesis to fully understand how this project came to be, they must understand my career experiences, as it is these which have shaped my thinking and my approach to my research.

My name is Derek Heraghty and I am an experienced health and safety professional in the construction industry. I completed my degree in Health and Safety 14 years ago before embarking on my career.

My current role is that of a Senior Health and Safety Manager on a Level Crossing Removal Project with a value of $530 million. It is my job to provide guidance and support to the leadership on all health and safety matters and to implement a system which can help facilitate safe outcomes.

The company I work for is Laing O’Rourke. Laing O’Rourke is a privately owned company which completes construction projects globally, with commercial values ranging from $20 million to $6 billion. We operate within a range of sectors including oil and gas, nuclear, mining, rail, commercial and many others.

For me to comprehensively explain how my research project came to be, I must first clarify how I became a safety professional. There are many who will claim to have become a safety professional as a result of their deep desire to help people. I, however, was not one of these people. I decided to become a safety professional while in the latter part of my secondary-level education. I did so as a result of career advice from professionals within the construction industry. The role offered me what I was looking for: working both outdoors and indoors, good salary, career opportunities, regular interactions with people and no physical labour.
However, on completing my honours degree in Occupational Safety and Health, I had already become disillusioned with the safety industry and all that it represented. It came across as overly legal and boring, with an endless focus on bureaucracy and statistics, rather than the practical achievement of safety and success. Furthermore, the majority of my neighbours and friends were working in construction at the time and were more than happy to inform me that the role of a safety professional was nothing more than a burden on a construction project and served no purpose but to slow the project down through demands for more paperwork and needless work stoppages. To them, the safety professional was someone who caused them trouble rather than helped them go home in one piece.

The first part of my career solidified both my earlier concerns and the thoughts provided by my neighbours and friends; safety was extremely paperwork-driven and focused more on ensuring the company was protected from prosecution than preventing physical harm. The worker was someone who had to be controlled through procedures and rules as it was dangerous to allow them to think for themselves.

I joined Laing O’Rourke in early 2012 in Australia. It was on my first project with Laing O’Rourke that my disillusionment with the safety profession became more pronounced, and this was because of one conversation.

**John’s Story**

‘John’ (not his real name) was a crane operator on our project. As our project was reasonably small in size, everybody knew John, because on any construction project, if you need anything lifted, you need to be on good terms with the crane team. John was well-liked and respected, and I found him talkative and positive when in conversation with him.

However, following the occurrence of any accident on our project, John’s demeanour dramatically changed. On every occasion following any event of which John was either a part
or had sighted, I requested an interview with John so that I could create a comprehensive accident report. On every occasion, John gave me the same answer.

“Derek, I don’t like doing interviews—they make me nervous. I’ll give you a statement instead. You just give me the piece of paper, and I’ll fill it in for you.”

Following the first few statements, it became obvious what his statement would say even before he wrote it.

“Derek, I did not see anything.”

When I asked John why he refused to share information, he gave me his honest thoughts which I have written down from what I can remember of them (the conversation was more than eight years ago):

“I’m thirty years in the game, Derek, and I have never seen one of these accident reports yet where one of the boys out here hasn’t gotten the blame somehow. These boys are just trying to do their job and I’ll be damned if my words are going to help you guys sack one of them for simply trying to get a hard job done. Everyone makes mistakes, but that doesn’t mean you should be sacked for it.”

His words were hard hitting. If our entire workforce shared John’s beliefs regarding the accident process, our learning following an event would be non-existent. After my conversation with John, I asked others in the workforce if they shared John’s views. The majority, particularly those who had been exposed to the accident process previously, believed that it was nothing more than a blame game, with little interest in learning.

On carrying out a review of all accident reports on the project, it became clear to me that there was more than an ounce of truth in what John and the others had said. Every accident report conducted on the project was focused on human error and competence, and all actions proposed were designed to fix the perceived flaw within the human rather than place any
focus on our system: toolbox talks, re-training, disciplinary action, etc., were the most common corrective actions found in the reports.

I was becoming increasingly aware of the fundamental flaws in the industry’s approach to safety, but the industry was still unwilling to change its approach to accidents and its focus on human error.

“If only the guys would just follow the procedures, we would have no problems,” managers would say.

At the time, this led me to question my future in the health and safety discipline, as I was no longer willing to work in what I saw as a toxic environment where trust between management and the workforce was low, and I could not see how my own role added any real value.

In 2014, Laing O’Rourke took the step to address the fundamental flaws which had existed in our approach to safety management (and everybody else’s) up until that point. The company leadership decided to use the research of Professor Sidney Dekker and his three paradigms to underpin their new strategy:

- People are the solution. The workforce would no longer be seen as a problem to control but would instead be a solution to harness.

- Safety is the presence of positives. Instead of placing an endless focus on accidents and negatives alone, we would also place a much more concerted effort into understanding how our people achieve success.

- Safety is an ethical responsibility. Our overall approach would become much more ethical by having a system which enabled the achievement of safety for the worker and where we would view human error as a symptom of a system issue.
Like many safety professionals, this new approach helped me realise the real potential of my role, which had not been clear previously. The role gradually evolved from one which was traditionally compliance and rule-based to one which was empowered to facilitate useable solutions that enabled the achievement of safety. To support the new paradigms within the company strategy, we introduced a variety of tools and techniques to help create this new era of empowerment and trust.

Of the three paradigms we now used, the most important element for me was ‘safety is an ethical responsibility’, as this was the foundation on which the other two were built. Without the creation of a trusting environment through ethical decision making, fear of retribution would discourage our workforce from sharing the honest information which is vital to any learning culture. People can only be viewed as the solution when they are willing to talk, and we can only focus on the presence of positives within safety when our people are comfortable enough to share their story.

In its approach to the ethical responsibility paradigm, my company decided to revamp our Safety Management System (SMS) by greatly reducing its complexity and size; the new system placed a much stronger focus on enabling success and building resilience into our production system.

The change in the SMS did indeed have a positive impact on how we went about our business as it greatly reduced the burden on management teams and our workforce, while ensuring that a stronger focus was placed on managing critical risk and engaging with the teams.

Though we had made great strides, I still believed there was another step required which would ensure we maximised the results from our approach. We had yet to formally adjust our justice approach to fully align with our new strategy. A common question from the workforce
when we explained our new strategy was, “What do you have in place to stop me getting the sack when it all goes wrong due to someone’s mistake?”.

This was a question which I struggled to answer. Although our approach to mistakes had softened, discipline and punishment were still used. This hindered some of our workforce’s willingness to share openly. Although punishment was used much less frequently, any punishment used to manage mistakes, whether used once or a thousand times, creates enough uncertainty in the workforce’s mind to ensure they err on the side of caution when considering disclosure. My personal opinion was that we needed to evolve our justice system approach from the traditional retributive justice techniques towards a restorative approach instead. The key issue with this approach is that the ideas put forward by researchers such as Dekker in regard to restorative justice had never been researched in the workplace up to that point. Therefore, when I put forward this idea to my own management team, they naturally asked for the data which would support my claim of the benefits of this approach—data I could not lay my hands on, as it did not exist.

Although there was little evidence of the effectiveness of a restorative justice system in the workplace, there was ample research which showcased the flaws in our current retributive model and the need for change. Using this research, I successfully convinced the leadership team on my project at the time (the civil construction of a nuclear power plant with a value of $6 billion and a peak workforce of approximately 4,000) to adopt restorative justice mechanisms when addressing mistakes which led to an unintentional negative safety outcome. This change would allow me to understand the impact a change from retributive to restorative mechanisms within the safety justice system would have on our learning culture.

The road I have travelled and the encounters I have had on my journey have shaped the beliefs that I have today regarding safety management, and people in general. My conversations with ‘John’ and others like him have led me to believe that we, as an industry,
have become over-reliant on paperwork at the expense of the people these systems were originally designed to protect: the worker.

However, using labels such as ‘bureaucratic’ and ‘overly legal’ simplifies what is actually a very complex area. There are many managers and business owners who hold a different view of systems and paperwork from the views of the majority of the workforce, and their points are equally valid. I have spoken to some who have the utmost faith in the system they use, and their belief comes from their own experiences. Many of these managers have suffered accidents in their workplace only to find the finger of blame pointing at them. They have quickly found their job on the line because, like the workers, they have found themselves being held accountable for events over which they did not have full control. It is only through the review of the system and the highlighting of mistakes made outside of their control that they were absolved.

Though the system is believed to be of assistance to the management team, it is often the hangman’s noose for the worker. The person found to have stepped outside of their system (usually a worker or supervisor, as the system controls sit predominantly with them) swiftly steps into the firing line. This is not just a workplace problem, but a societal one. When something goes wrong, people strive to find someone to blame. Therefore, it is not the bureaucratisation of our workplaces that is the core issue, but society’s need to find someone to blame. The bureaucracy created is but a reaction by businesses to defend itself against humanity’s demand for blood when something negative occurs.

Many also stress, and rightly so, that if safety were not a legal requirement, the standard across the industry would not be nearly as high. A vast number of clients in the industry continue to opt for the lowest price. From the perspective of some, if there were no legal requirements to deal with risk management in the workplace, resources would be downgraded to reduce the value of the bid, and safety would naturally suffer as a result. It is
easy for someone outside of the industry to say that safety is a moral responsibility, but as a business, you either put forward competitive bids or you quickly go out of business. When you have two conflicting goals, such as the provision of the lowest price and investing in the best controls to manage risk, something will naturally have to give. It is not only the ethics of the people managing the workplace we must focus on, but the ethics of the customer buying the product. Until the customer stops demanding the lowest price at all costs, the conflicting goals will remain.

All of this has helped me to determine the type of researcher that I am. Though I strive for people to be treated fairly, this is not only because I believe it is morally right to do so; I am not merely an activist researcher acting on behalf of the workers. It is because I also believe that an increase in trust between all stakeholders in the workplace will ultimately have a positive effect on the success of the company through increased production and quality of work. This in turn will provide the organisation with the additional funds to invest further in their organisation, and it becomes a win-win for everyone. My research is not focused primarily on people, but on the impact that mutual trust within an organisation can have on learning, and ultimately, success.

The project was carried out on the construction site of a Nuclear Power Station. I worked for the main civils contractor who was constructing all structures on site. We operated with a direct workforce (minimal contractors) and we were a large subcontractor to the site’s principal contractor, our client. No contractors were involved in this study. My role was the Health and Safety Systems and Improvements Manager, and I had oversight of the accident process. As the research setting was my own workplace, the potential for bias was ever constant. Some of those I interviewed were my peers within the safety team, others were supervisors I engaged with on work matters, as well as the Project’s Health and Safety Leader and Construction Director who were both my superiors. All of this meant that there was
significant risk for confirmation bias on my part due to my pre-formed opinion of those being interviewed and their responses. During these interviews, I had to constantly remind myself of my role as a researcher, as it would have been very easy to revert back into my role as a safety professional on the project and project my opinions onto them. This was particularly the case where I was studying the restorative accident process, as I was much closer to the accident process than I had been with the analysis of the previous retributive process (many of these accidents occurred before I joined the project). One way I tried to minimise this was by stressing at the beginning of the interview that my role was that of a researcher, not their colleague, and that they were empowered to challenge my questioning at any time they believed I was veering towards bias.

Though my role within the organisation had influence over the system side of the accident process rather than the operational side (accountability, instruction of actions etc.), it is important to reflect on how I was viewed by those being interviewed. Many of the workers I spoke to were unfamiliar with me which gave the benefit of the interview feeling more objective than if it was conducted by the operational safety team as I was viewed by them as an outsider doing research. This made it easier to build trust with them as they didn’t view me as their superior or someone who was going to cause them problems. Those exposed to the retributive accident process were also keen to get their story across as they felt they had not been listened to during their own accident analysis. Both the safety team and the senior management were slightly different as they knew me and viewed me first and foremost as a member of their team who was conducting research. This often led to them being cautious early in the interview. I often had to refer to the University’s ethics protocols to allow them to recognise that any misuse of their information could see my PhD cancelled. Once they knew I had something to lose, they usually opened up and were more trusting of me and the process.
What I know now is that though there are downsides to carrying out research in your own company, the benefits far outweigh these. The relationships that existed between myself and the management team provided me with the ability to alter the accident process for research purposes and to delve deeper into the organisation’s system than an outsider would ever have been allowed to, particularly following the process’s termination.
Chapter 1: INTRODUCTION

Accidents have long been deemed a valuable resource for both organisational and industry learning. For hundreds of years, industry has sought to understand accidents and rectify the issues which led to them occurring. Accident analyses have typically had three clear goals:

1. to understand what happened,
2. to determine and implement actions to help prevent a reoccurrence, and
3. to hold those deemed to have influenced the event accountable.

These goals are interdependent. Both the accident narrative and the subsequent actions are shaped by the approach taken by the facilitator to understand the event, while the approach taken by the body in charge to discharge accountability influences both the narrative and the recommendations.

‘Accountability’ is a term that is used frequently within organisations when discussing accidents. Throughout this project I will use the definition given by McGrath and Whitty (2018) which is the “liability for ensuring a task is satisfactorily done”. However, each person who uses the term will have their own idea of what it means to be accountable, just as there are a wide range of views on the most suitable approach. All sides of the debate agree that the approach to accountability influences an organisation’s ability to learn. The disagreement is centred around the use of punishment and whether it helps or hinders an organisation’s learning culture.

Prior to the works of Heinrich (1931), the study of accidents was mainly limited to large scale disasters. South Shields (1839), Tay Bridge (1879) and the Titanic (1912) are examples where a significant loss of human life triggered the need to understand more. The fact that these were all led by legal professionals may have influenced subsequent approaches to
accident analysis, particularly the language and the apportioning of blame. Due to events such as these, as well as demands for social reform around working conditions and injuries, the onus of safety management and the prevention of accidents was increasingly placed on the employer.

As a result of increased legislation regarding the physical protection of the worker and the influence of the works of Heinrich and his contemporaries, organisations and employers began to take a far greater interest in the safety of their people and the need to achieve safe outcomes. Organisations did this by placing an emphasis on understanding the causal path that led to accidents. They began to conduct their own accident analyses as safety-improvement activities, separate from any external legal process.

Both the behaviour of the workers and the environment in which they operated came under increased scrutiny as industrial growth progressed through the 20th century. Although fairness had always been a contentious issue within workplaces, safety and accidents created another avenue for the perception of unfairness to emerge among the workforce. Many organisations mirrored the legal approach used by public inquiries to help understand the accidents occurring within their workplace, but in this case, it was the worker on trial. Potential for punishment now extended beyond performance management to include breaches of safety rules.

Believing that contemporary accident analysis processes were too fixated on human error, and that this fixation had a negative impact on organisational learning, James Reason created the concept of a ‘just culture’ (1997). The key goal of a just culture was to ensure people involved in accidents were treated fairly, and at the same time were held accountable for specific situations, such as procedure violations. Reason’s belief was that if there was a clear line between culpable and non-culpable behaviour, people would feel safe to talk openly. When adopted in the operational space, accountability for these specific situations was
largely based on discipline. Subsequent authors (Dekker, 2007; McCall & Pruchnicki, 2017) have argued that, while Reason’s work was a huge stride towards achieving fairness, those subject to organisational processes based on his work remain vulnerable. Many researchers (Dekker, 2002; Leape, 1994; Wu, 2000) have argued that the potential for punishment allowed for in Reason’s framework compromises learning. Some researchers (Dekker, 2007; McCall & Pruchnicki, 2017) suggest moving away from punishment completely towards a restorative approach to justice. Others (Boysen, 2013; Marx, 2001; Pellegrino, 2004; Reis-Dennis, 2018; Walton, 2004) argue that punishment is needed to achieve a just culture. The problem which exists for both arguments is that the theories include untested empirical claims regarding the effect each approach has on learning. For an organisation with no formal just culture process in place, adopting Reason’s original framework was low risk. Several papers (Lightizer, 2012; Meadows et al., 2005) discuss the experiences of organisations implementing it. However, there is very little research telling organisations what to expect if they try to move beyond just culture and towards a restorative approach. The purpose of this thesis is to explore the changes, if any, that have emerged as a result of adjusting an organisation’s accident process and its judicial system, moving from retributive mechanisms to a restorative approach.

1.1 Research question

This project consists of 4 research papers which are captured in Chapters 2-5 respectively. An overview of each of these papers is provided in section 1.3 of this thesis. The primary question of this thesis, along with all of 5 of its sub questions, were determined prior to commencement of the research.

The primary research question of this project is: ‘How does a shift in the accident analysis process impact a learning culture?’
The primary aim of this research is to understand whether a change in an organisation’s accident process can influence its ability to learn. To achieve the research aim, an organisation’s accident process would be modified from one is predominantly retributive based to a restorative approach. For clarity purposes, retributive justice refers to the repair of justice through the use (or at least potential use) of punishment (Wenzel et al., 2008), whereas restorative justice is a process where all of those affected by an injustice have an opportunity to discuss the damage done and to decide how best to repair the harm (Braithwaite, 1989).

Achieving a learning culture is the key goal of any just culture, and this is what most just culture authors (Dekker, 2012; Marx 2001; Reason 1997) aspired to when they prescribed their approaches. An organisation which possesses a learning culture “has the willingness and competence to draw the right conclusions from its safety information and the will to implement major reforms when their need is indicated” (Reason, 1997). The reason the term ‘learning culture’ is used within the research question, as opposed to ‘learning’, is to ensure the focus is as much on the accident process’s impact on the organisation’s culture and its influence on future learning as it is on the learning gained from each specific accident discussed. Using an ethnographic approach within a large construction organisation, the analysis of the accident process allows the provision of a rich comprehension, not only of how a specific accident approach can influence learning, but also the true intentions of the process and the reason for its creation.

This primary research question will be answered through the following sub-questions:

1.1.1 What is the relationship between the degree of retribution and the willingness to share safety-critical information?

Several researchers have highlighted the link between the type of justice system used in the workplace and the willingness to share safety-critical information. The use of punitive or
blaming methods within a justice system to manage mistakes or errors is claimed to be not only harmful to the worker (Wu, 2000) but also to an organisation’s learning ability (Ruitenberg, 2002). Workers are much less likely to report mistakes if they fear retribution (Merry & Smith, 2001).

Within a complex environment such as a workplace, it is critical that information flows unhindered, and the type of justice system used can significantly impact this movement. This sub-question examines, through the perceptions of those involved in actual accidents, whether the level of punishment that was used as part of the process had any bearing on the quantity of information they were willing to share and its authenticity.

1.1.2 What impact, if any, does language have on decision making following an accident?

The relationship between word choice and decision making has become a prominent topic in recent years. Studies conducted by Boroditsky and Thibodeau (2011) showed that language and metaphors used to describe situations can influence our interpretation of problems and our subsequent decision making.

This question enables the study of language and framing as part of the accident process and the effects that both have on the decision making of various individuals involved throughout the process.

1.1.3 What are the unintentional by-products of an accident process which uses restorative justice mechanisms?

According to Zehr and Gohar (2002, P. 40):

Restorative justice is a process to involve, to the extent possible, those who have a stake in a specific offence and to collectively identify and address harms, needs and
obligations, in order to heal and put things as right as possible.

Before commencing this research, the restorative approach to accident analysis was discussed mainly in a positive light (Dekker, 2012; McCall & Pruchnicki, 2017), with very little written about the problems which arise when using this approach. Outside of safety academia, authors such as Daly (1999) have long warned against restorative justice being viewed as the silver bullet and the dangers which exist should the approach be misconstrued as one which is the opposite of retributive justice.

This question ensures that it is acknowledged that biproducts often emerge following the introduction of a new process. It is important to gain a full understanding of these emergent properties including the benefits they provide and the risks they pose.

1.1.4 How do opinions about the achievement of justice and the approach used vary between different levels of the organisation?

To prevent the public from losing faith in the system, it is necessary that there is at least some congruence between public opinion and criminal justice arrangements and procedures (Morgan, 2002). Within this study, the opinions of personnel from different levels of the organisation were sought to understand their views on each of the accident approaches used, the level of fairness provided by these approaches and the benefits gained through their use.

According to Dekker (2007), usually it is only the more powerful people within an organisation who consider the organisation’s culture to be fair. This question sought to understand the level of truth in this statement and whether the opinions of those at different levels of the organisation are shaped by the role they play within the organisation.
1.1.5 Is there a distinct difference in the opinions on the justice system between those who have been directly exposed to the system to those who have not?

Dekker’s theory indicates that the higher a person is positioned in an organisation’s structure, the more likely they will perceive their culture to be fair. Within most industries, it is those who operate within the lower-level positions of an organisation who suffer the most accidents due to their exposure to much greater physical risk. As a result of this, it is these same people who are then exposed to the safety justice system. This question was sought to understand the level of difference in opinion between both parties, if any, and what are the drivers in any differing views.

1.2 Thesis statement

Following the analysis of the accident process through the above research question and the associated sub-questions, another question began to emerge: “What is the primary purpose of the accident process?”

The terms ‘accident process’ and ‘accident analysis process’, are both used frequently in this thesis. When the ‘accident process’ is referred to, this includes all of the reporting aspects, the accident analysis component and the associated system requirements such as HR, while the ‘accident analysis process’ simply refers to the analysis of the event. When this project originated, it was based on the commonly held belief that the primary goal of the accident process was to aid learning to prevent a similar accident occurring. However, the data gathered describes a much more entangled set of purposes. Though organisations do wish to learn from accidents, the process itself is primarily a means to manage a potential threat. The risk faced by organisations is that they will not be able to provide a satisfactory account to external stakeholders following an accident. This account needs to include:

- a narrative of the accident
• the process that was followed, and

• a set of actions.

These need to meet the expectations of stakeholders who expect narratives, processes and actions that reflect their own understanding. If the organisation cannot provide this account, the threat is that they will have an account imposed on them (potentially including undesired narratives, processes and/or actions). Given that the societal system is attuned to a particular set of narratives of personal responsibility, while also demanding that organisations learn from accidents, organisations are left with a dilemma due to these often-contradictory requirements. The accident process exists within organisations to deflect this threat from the business through the creation of corrective actions following an accident and by allowing managers to discharge their own accountability from the societal system by creating new accountabilities for workers. Organisational blame occurs as a proactive measure against a threat the organisation has no real control over. Through the use of retributive justice following an event, the organisation is able to display to the societal system that they have found and managed the problem, which reduces the risk of them being held accountable by the other stakeholders or the societal system. The use of retributive justice by the organisation to discharge accountability also ensures alignment with society’s approach. Through the process, responsibility is directed away from the organisation and placed on the individual. The discharging of accountability through retributive justice leads to the individual constructing a narrative they believe will provide the best defence against somebody else taking over the process and the narrative, as opposed to an honest portrayal of the event and their involvement. Organisations and their managers are not using punishment because they want to; they are doing so because they believe that if they do not provide a satisfactory account, such as a narrative where an individual was responsible and has received consequences, they themselves may be in the firing line of their societal system.
In the organisation studied in this thesis, at the time when the restorative accident process was implemented, this was not well understood, and the risks associated were underappreciated. What is known now is that the removal of the ability to punish created significant apprehension among senior leaders as they recognised that the potential to receive punishment could never truly be removed from the system, given that it existed within a societal justice system which is retribution based. By removing the ability to punish following an accident, senior leaders saw that their accident process was no longer aligned with society’s beliefs on accountability or its justice system, which left them, in their eyes, exposed to a very real threat without a weapon to defend themselves. Figure 1 below shows how by moving to a restorative approach, the threat of punishment moves, rather than disappears. This diagram is a simplified version of a larger diagram in Chapter 5.
Figure 1: The effects on blame through the introduction of a restorative accident process.

1.3 Methods

1.3.1 Methodological considerations

This thesis reports on four research studies that have been designed and constructed to answer the primary question: “How does a shift in the accident analysis process impact a learning culture?”.

Chapters 3, 4 and 5 each report the methods relevant to these individual studies.

Determining a suitable methodological approach to this study was extremely difficult. Unlike other aspects of an organisation, such as workplace culture, industrial accidents are not...
something that can be studied in the present tense. What can be studied is the report
describing the event and the subsequent learnings in a historical context. Unless a researcher
happens to be embedded prior to and during the accident, they only have access to the events
as interpreted through accident analysis processes and described in the reports created by
these processes. Safety scholars do not usually view themselves as historians, but in the area
of accident analysis, in reality, they are. Distinct from many other types of historical
accounts, of which there are often multiple versions available to us to allow us to gain a more
holistic understanding of what occurred, accident reports more often than not only allow for a
single story to be told. Also, despite their objective tone and intent, accident reports are
explicitly designed to create action and change. When evaluating historical sources, highly
intentional documents (those advocating for a particular change or viewpoint) are considered
to be less credible. Several authors have discussed the dubious or controversial status that
accident reports have as data. Dekker (2014) points out that the fact that accident reports are
written based on something that has already gone wrong leaves the report and those
facilitating it vulnerable to hindsight bias. The need for firm conclusions and action also
creates vulnerabilities in the credibility of the data. Leveson (2004) contends that most
accident reports use a reductionist approach to source the broken components which caused
the accident, an approach which will influence both the focus of the story and subsequent
decision-making regarding accidents. In addition to this, Rae, in his work, Tales of Disaster
(2015), talks about the way that storytelling choices fundamentally influence not just how
information is presented, but also how it is interpreted. All of this shows that a great deal of
cautions is needed when using accident reports as the main or sole source of data when the
analysis process itself is the subject of the research.

So how does one measure the impact of a modification to the accident process? Measuring
safety improvement is something other authors have struggled with. In his work, Organising
for Safety (2019), Hopkins wrestles with how one can accurately measure the results of a change in the safety system. Not dissimilar to this study, Hopkins’ work investigates the means to measure whether or not safety has improved in an organisation following a significant change. His conclusion was that, rather than relying on quantitative data, it was much more beneficial to gain the perceptions of those exposed to the system and use these as the raw data.

It is not just measuring change where authors have struggled when it comes to data, but in accident case studies as well. Regarding her landmark review of the Challenger accident, Diane Vaughan has discussed how she struggled in the early stages of her study, as she had been using the Presidential Commission’s official report as her primary data rather than recognising it as an “interpretation of original documents, testimony, and interview data” (Vaughan, 2004). Her conclusion was that it is necessary to move beyond the event itself to gain an understanding of the system from which the event emerged.

Recognising the struggles faced by both Vaughan and Hopkins, as well as the concerns raised by the other authors mentioned above, I decided against using accident reports as the basis of my research. Instead, this thesis tries to study the very process of producing those reports. Thus, an important question is raised: what is the epistemological and ontological approach that needs to be taken if we are trying to understand and analyse the very process of reaching conclusions about what has happened in the wake of a traumatic workplace event? This is something I thought hard about before I started my thesis but continued to revisit throughout the work. I engaged in numerous interactions with peer reviewers who wanted to assert that there was one true account of events as produced by the report that should be checked against the accounts of those people involved in the accident. This made me deeply uncomfortable. Ultimately, what I decided was that any account of accident analysis must necessarily embrace the fact that there are multiple coexisting perspectives and that it is unreasonable for
a researcher to either reconcile or to cross check these perspectives. To do so would put the researcher in the place of an accident analysis facilitator, not the place of someone seeking to understand the justice of the process.

Therefore, it is necessary that I fully embrace a social constructivist ontology, as social constructivism recognises that knowledge is constructed through social interaction and is a shared rather than an individual experience (Vygotsky, 1978). In social constructivism, it is acknowledged that there can be multiple representations of reality; this helps to represent the complexity of the real world and avoid oversimplification (Jonassen, 1994). It is acknowledged in this thesis that there is no objective way to examine an organisational justice process. Every version of events, including the official reports and the researcher’s account, is a post-hoc interpretation of what happened. With this in mind, I believe that the most suitable way to gain a better understanding of the organisational justice process is to analyse the experiences and perceptions of those who oversaw the process and those who lived it. The accident process itself is a social construct which has different meanings to different people. Concerning the accident process, meanings and interpretations are constructed by the research participants as they engage with the world they are interpreting. Each individual (including the researcher) makes sense of the world based on historical and social perspectives. The generation of meaning is a social, interactive process.

Because I am an ‘insider’ researcher, able to study these things as they are occurring, the primary epistemological approach I take in this thesis is ethnography: I am trying to describe the events as they happened. Accident analyses are a living process for all involved and it is crucial for different experiences to be captured and understood.

What we see through this process is that the constants are a social constructivist ontology and ethnographic methodology. The specific methods varied according to the sub-questions I was
trying to answer. In each of the chapters, I describe more explicitly the method I was following for that part of the work.

One of the key themes in this research is the idea that people take a self-protecting stance during accident analyses. This very conclusion challenges the authenticity and validity of any statements that people make about the process. These are things that I have struggled with, but these are things that are also inevitable for anyone who wants to rigorously study accident analysis. Any reader of this thesis will always have questions about the validity of quotes. Why did someone say this? Did they say this to protect themselves? Ultimately these questions cannot be answered definitively. The best that I can do is honestly present the data as it came to me and honestly present my interpretation of the data as an ethnographic study.

The methods selection was chosen for this thesis was chosen on the basis that it could be sensitive to the difficulties identified above while also allowing conclusions to be drawn that could become reasonable recommendations for organisations.

1.3.2 Methods selection

When selecting the methods approach to this study, previous research was analysed to help determine the most suitable methods as well as the overall approach. It was recognised that in order to gain a sound understanding of a construction workplace, which is both dynamic and complex, there was a need for an approach which had the capability of truly capturing what was really going on. Ethnographic approaches have been shown to have the capacity to help understand messy settings (Vaughan, 2004) and provide flexibility when selecting methods (Hubscher-Davidson, 2011; Suwankhong & Liamputtong, 2013).

All of the methods below were considered before selecting those that were ultimately used.
<table>
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<tr>
<th>Method</th>
<th>Description</th>
<th>Strengths</th>
<th>Weaknesses</th>
<th>Research example</th>
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<tbody>
<tr>
<td>Embedded (Naturalism)</td>
<td>The ethnographer is embedded within the team of workers whom they are studying for the duration of the study.</td>
<td>- Subjects observed in natural environment leading to highly accurate data</td>
<td>- Expensive</td>
<td>Fossey (1972)</td>
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<td></td>
<td></td>
<td>- Due to being embedded, access to information only available within the group</td>
<td>- Highly time consuming</td>
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<td></td>
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<td>- Researcher can “go native”</td>
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<tr>
<td>Participant observation</td>
<td>The participants are shadowed by the ethnographer to help understand what occurs</td>
<td>- Better understand the participants’ experiences and habits</td>
<td>- Presence of the researcher can alter behaviours of the subjects</td>
<td>McDonald et al. (2006)</td>
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<tr>
<td></td>
<td></td>
<td>- Minimises the risk of the</td>
<td>- Relationship between</td>
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<td>Method</td>
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| - Interviews | A cross section of the relevant individuals are asked predetermined, open ended questions to allow the participant to tell their story in great detail and to help provide the researcher with a rich understanding of the study | - Detailed information can be obtained and avoids oversimplifying complex issues  
- Provides flexibility to the interviewer  
- Non-verbal behaviour of the participant can be witnessed and acted upon | - Interviewer may influence responses  
- Requires training to be effective  
- More difficult to analyse if unstructured and qualitative in nature | Provan (2019) |
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<th>Description</th>
<th>Strengths</th>
<th>Weaknesses</th>
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<tbody>
<tr>
<td>- Surveys</td>
<td>Survey research is the collection of information from a sample of individuals through their response to questions. Survey research can be both quantitative and qualitative.</td>
<td>- Low costs&lt;br&gt;- Convenient&lt;br&gt;- No observer subjectivity&lt;br&gt;- Precise results&lt;br&gt;- Can capture a large range of respondents</td>
<td>- Low response rate&lt;br&gt;- Potential for questions to be misunderstood&lt;br&gt;- No possibility for follow up questions</td>
<td>Gruenefeld et al. (2018)</td>
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<td>(Analytic induction)</td>
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<tr>
<td>- Focus groups</td>
<td>A Focus group is a purposely chosen group of individuals used to discuss an issue or topic to allow the researcher/</td>
<td>- Interactions can stimulate disclosures which otherwise may have gone unstated</td>
<td>- Participant responses can be influenced by others in the group&lt;br&gt;- Individuals can chose to</td>
<td>Kneale (2002)</td>
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<tr>
<td>Method</td>
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| - Archival      | Archival research is a qualitative approach to ethnographic research in which the researcher analyses existing historical documentation | - Reduces potential for experimental bias  
- Access to large deposit of research data can result in more accurate results. | - Those who collated the data may have been biased  
- May not accurately reflect research group | Vaughan (1996) |
| Research example | facilitator to explore their chosen topic. Participants are usually free to give their views on any aspect of the topic. | - Comfort of the group setting can be conducive to discussing sensitive topics  
- Faster than the interview approach | remain silent because of fear of saying the wrong thing | |
For this thesis, it was decided that a range of methods would be needed to achieve the project’s goals. In Section 3, a survey is used to help understand whether the way in which the story of the accident is told influences the reader’s decision making and the focus of their corrective actions. The survey was deemed the most suitable approach for the following reasons:

- It allowed for anonymous responses which reduced the risk of participants having to fear judgment of their answers. With an interview or focus group, the presence of others, including the facilitator, may influence the participant’s response.

- More time was available for the respondent to read their allocated accident report before responding than would be likely available for either an interview or focus group.

- It had the capability to capture a large number of participants in a short space of time.

- The means by which the information was gathered allowed the research team to gain quantitative results and communicate the impact of language and framing in a simple manner.

In Section 4, interviews were used in association with archival research. The goal of Section 4 was to gain the perceptions of the retributive accident process in place. The methods chosen were believed to be the most suitable for the following reasons:
- Observations were impossible as the accident case studies had already occurred,
- The use of a survey would be unable to provide the depth needed to understand the topic in question,
- Accident analysis is a very sensitive area and focus groups did not provide the level of confidentiality needed to attain true honesty from participants,
- Individual perception was important as two of the research questions focussed on the differences in opinion between people in different levels of the organisation,
- Interviews allowed for participants to tell their story in a confidential setting while providing the necessary flexibility in the approach to questions,
- The use of archival research was important in selecting accident case studies and determining the necessary participants.

In Section 5, interviews were again used in addition to a modification to the accident process. The goal of Section 5 was to gain the perceptions of the restorative accident process in place and compare it to the previous retributive approach analysed in Chapter 4. The methods chosen were believed to be the most suitable for the following reasons:

- An experimental approach was selected (the accident process modification) as it was deemed the best way to understand the difference in perceptions of a retributive accident process versus a restorative accident process,
- Observations were unusable as it would be impossible to know when and where accidents would take place and it would also be unethical,
- The use of a survey would be unable to provide the depth needed to understand the topic in question,
- Accident analysis is a very sensitive area and focus groups did not provide the level of confidentiality needed to attain true honesty from participants,

- Individual perception was important as two of the research questions focussed on the differences in opinion between people in different levels of the organisation,

- Interviews allowed for participants to tell their story in a confidential setting while providing the necessary flexibility in the approach to questions

It is important to note that the methods chosen for each of the sections were determined by taking the project as a whole into consideration. The central piece of this project is the accident process modification in Chapter 5 and the methods selected for Chapters 3 and 4 were done so to provide the support necessary to maximise the learnings from the research for Chapter 5. For example, the interview questions for Chapters 4 and 5 are identical so that the perceptions of both the old and new accident process could be accurately compared against one another. Also, the method for Chapter 3 was intentionally quantitative to serve as an addition to the qualitative information sourced during the research for Chapters 4 and 5.

Previous research was also an influencing factor when determining the necessary methods. An ethnographic, case study approach was chosen as a number of studies had used this approach previously to provide a greater understanding of both accidents and accident analysis. The most notable of these was that of Vaughan (1996) and the Challenger event which helped introduce important new concepts such as the normalization of deviance. Others, such as Oswald (2015) used ethnography in a construction setting to gain a greater understanding of the behaviours that influence an accident, while Rooke and Clark (2005) also used an ethnographic case study approach in a construction setting. Their focus, rather than accidents, was placed on learning and how it is influenced, not dissimilar to this study. More on ethnographic studies within the construction industry is discussed in Section 2.6.5.
The approach taken to this thesis was that of a long-term, classical ethnographer, while using short-term techniques. “Thick description” (Geertz, 1973) was used to allow both the researcher and the reader to understand not only the approach taken to analyse each accident but the reasoning for this approach. This allowed for a greater understanding of the thoughts of those exposed to the process as well as those overseeing it. A short-term, or rapid, ethnographic approach was chosen as it allowed for a more deliberate and interventional approach (a change to the accident process) to that of a long-term participant observation (Pink, 2013). Also, as highlighted in a previous study (Loosemore et.al., 2015), the construction industry is highly intensive with little time for people to engage with researchers. Traditional approaches such as spending extended periods of time on site or asking individuals to complete diaries was nigh impossible. Rather than aiming for numerous conversations with random participants, rapid ethnography meant the study would be more focussed on a specific area of interest identified by theory and interviews would be targeted (Baines and Cunningham, 2013; Loosemore, 2015) based on their exposure to the accident process. In addition to interviews, the accident reports and all the associated evidence was used as a means of data. Hopkins (2006) states that accident reports contain priceless information and can often provide information a standard ethnographer could not hope to gather due to the environment in which they are gathered. He describes the use of accident reports as “armchair ethnography”. Previous researchers, such as Vaughan (1996) and Turner (1997), have also used accident reports as data to further understand organisational culture.

1.3.3 Participants

The participants in this study were all employed by a single construction organisation and worked on an individual construction project. The participants’ roles ranged from general operative to senior leader.
1.3.4 Ethics

Human research ethics approval was required for this research and was granted for the following:

- Accident Report Interpretation Survey – GU Reference No.: 2017/ 839
- Safety Climate Survey – GU Reference No.: 2017/ 889
- Safety Justice Discovery Sessions – GU Reference No.: 2017/ 850

The potential ethical issues were captured individually within the information pack for each research element and this pack was communicated to each participant to ensure any potential ethical problems were avoided.

The Griffith University Human Research Ethics Manual and booklets relevant to this study were reviewed and the recommendations were incorporated into the research design and methods.

Approval was obtained from the employers of all participants and permission was obtained to publish the results.

1.3.5 Own company research

Due to the nature of the study, it was important that the researcher for this work was a member of the organisation. Adjusting a justice system is a deeply sensitive matter of which organisations are highly protective, due to the implications it may have on their business. To carry out a sustainable modification to the justice system required a level of trust between the organisation and the researcher. This would have proven extremely difficult for a person with no prior knowledge of the organisation and its culture.

It is important to reiterate at this stage that the participants in this study were all employed by a single construction organisation and worked on an individual construction project. The participants’ roles ranged from general operative to senior leader. Due to my employment
with this organisation and my working on this construction project, my awareness of the organisation’s culture and those who participated in the discovery sessions meant that it was inevitable, and desirable, that my personal opinions would influence my approach. However, there existed the potential for the research to be overly constrained or directed by my personal opinions. To ensure this was not the case, all questions were vetted by the research supervisors.

The accident report interpretation study approach was influenced by the work of Leveson (2002), Hollnagel (2014) and Dekker (2014). All three advocate the use of a systems approach when managing accidents in the workplace, while Dekker encourages the use of multiple narratives to support learning. The emphasis on the importance of language was influenced by the works of Boroditsky (2011).

There was also the potential for bias on behalf of the participant due to my role within the organisation. To attempt to minimise this risk, I communicated clearly to each participant the ethical requirements placed on me as the researcher and the ramifications should they not be followed. Also communicated were the avenues available to them if they believed these ethical requirements had not been met.

1.4 Overview of thesis

The following section outlines each main chapter of the thesis and the contribution to the research questions.

**Chapter 2: Just culture literature review**

Chapter 2 explores the history of safety in the workplace and how industrial advances, increased regulation and the misinterpretation of research all helped to create a work environment that was in need of a just culture approach. Over 110 articles were reviewed to understand how an accident process and the justice mechanisms used can influence the ability
of an organisation to learn. Two distinct views emerged from the research, which differ in their beliefs about how justice is to be achieved. One approach allows for retributive mechanisms to be used, while the other believes restorative justice is the way forward. Interestingly, although a significant amount of discussion exists regarding both approaches in the literature, there has been minimal research carried out in the area of just culture, and none which attempts to understand the perceptions of a just culture approach at different levels of an organisation and how it influences learning. Given that organisational justice is the perception of fairness in the workplace, I was interested to know how those involved in the accident process perceived the fairness of both retributive and restorative accident processes and whether the approach influenced the ability for the organisation to learn. Before carrying out any further research in the area of just culture, it was crucial to understand not only the current research in the area of just culture, but what additional factors are likely to influence the approach taken. It became clear that language, organisational culture and societal culture all have the ability to influence the achievement of fairness through the accident process and all require due consideration.

Chapter 3: The influence of language and framing

Chapter 3 explores the influence the language and framing used within an accident report have on the report’s readers and their subsequent decision making. This chapter sets out to answer Research Sub-question 2. The research was designed to understand whether providing three different styles of accident reports describing the same accident would influence the reader’s decision making in regard to the type of corrective actions chosen and whether they would be human or system-focused.
Chapter 4: Retributive justice and incident investigations

Chapter 4 explores five accident cases within an organisation where retributive justice mechanisms were used as part of the accident process. This research was carried out using a semi-structured interview which contained four open-ended questions designed to allow each participant to share their perception of the approach taken to accident analyses, the treatment of those involved and the impact the accident process has on both the individual and organisational learning. This research allowed Research Sub-questions 1, 2, 4 and 5 to be partially answered, as well as providing baseline data against which the findings from the modified accident process could be compared.

Chapter 5: Justice through restorative mechanisms

Chapter 5 explores five accident cases where a modified accident process using restorative justice mechanisms was used. The research took place over eight months of a planned 12-month study. This research used an identical approach to that used in Chapter 4 to allow the results of both studies to be comparable. Both the questions used, and levels of the organisation spoken to, matched those used when analysing the previous accident process. This research provided the data for contrast with the data found in Chapter 4 and to conclusively answer Research Sub-questions 1, 2, 3, 4 and 5.

Chapter 6: Conclusion

Chapter 6 is an overall conclusion of the thesis. It provides a narrative of how the research aim was achieved. In this section, the means by which each of the sub-questions were answered is addressed, as well as the key findings associated with each question. Also addressed in this section is the scientific contribution of this thesis. This section concludes by highlighting the practical implications of the thesis.
Chapter 2: LITERATURE REVIEW

Statement of contribution of co-authored paper:

This chapter includes a co-authored paper submitted for publication. The bibliographic status of the co-authored paper, including all authors, is:


The primary author of this paper was Heraghty. Both Rae and Dekker served in the roles of supervisors and provided feedback at regular intervals and conducted a final review prior to completion. Breakey provided subject matter expertise in the area of ethics and also reviewed the paper before submission. Breakey had initially written a section of this paper, 2.5.5. However, this has been removed due to external reviewer feedback.
2.1 Rationale for the study

To understand the influence an organisation’s approach to accident analysis has on a learning culture, it was important to understand what research had already been carried out in this area. Before embarking on a research project which would test a specific approach to ‘just culture’, it was essential that I understand the origins of the term and how it came to be deemed a necessity across industry. Nothing of this nature existed previously, as most works written on the topic are descriptions of how just culture should be achieved, rather than how it came to be. There was also very little to be found on factors external to the safety system which may impact an organisation’s ability to achieve a just safety culture.

I initially began my research project with the following question in mind: “What are the implications when safety justice evolves from retributive to restorative?”

This query was inspired by a growing debate across the industry about whether the use of punishment was beneficial to safety. This initially led me to focus on the different types of mechanisms used to achieve justice. However, it soon became apparent that the question I wanted to answer was broader than the one I initially conceived. I wanted to know how the accident process influences future learning. This required me to delve into the history of safety in the workplace and how its evolution has influenced the treatment of those within the system. The literature highlighted a number of areas which would influence my approach to my research question. For example, research in the areas of language and accident analysis allowed me to recognise that it was not enough to simply modify the justice mechanisms in order to answer my question—the entire accident analysis approach and the associated language also required modification.

This literature review had a strong influence on my research as it broadened my understanding of a just culture and the many influences which exist that can impact the
approach to justice both during, and as a result of, an accident report. As well as helping to shape my overall research question, several of the sub-questions also only emerged after my literature review was completed.
Can restorative justice mechanisms redeem just culture?

2.2 Abstract

The belief that organisations which have invested in a ‘just culture’ approach achieve fairer outcomes and a greater capacity to learn from mistakes is one which is now deeply entrenched across a range of industries. Regardless of the approach taken, it is acknowledged that any form of just culture is better than none. However, the level of benefit provided by different approaches can vary significantly, while the impacts of some may even prove to be counterproductive. In this paper, I examine how the pursuit of fairness within industry in the safety space has continually evolved and I consider where this evolution has led us. While hailing the importance of the original just culture concept, its significant limitations, particularly its affiliation to linear-style accident reporting and retributive justice mechanisms, are showcased in depth. To build on the ideals of the original just culture, I suggest the use of restorative justice mechanisms and forward accountability to help improve both worker and organisation resilience in the face of risk and adverse events. Also emphasised are the dangers faced by all approaches to just culture: influences such as organisational culture, societal culture and language can all negatively impact any attempt to achieve a just culture unless given proper consideration.

2.3 What is just culture?

The idea of a just culture, originally intended to assuage worker concerns around safe reporting and to encourage organizational learning, has become commandeered by shorthand managerial decision algorithms for determining worker culpability. These models are often retributive, reductionist and retrospective. ‘Just culture’ now often stands for a blunt HR performance management instrument, for declines in self-reporting or threats of reporting colleagues. It has turned, on occasion, into a verb used by the people on the receiving end of
the decision-making process. In this paper we explore whether restorative justice can redeem just culture. Restorative justice shifts an organisation away from a just culture organised around rules, violations and consequences, towards a culture that is focused on the impact that an event creates for all kinds of stakeholders, the needs it creates, and the obligations it gives rise to. Some attempts to introduce restorative just culture mechanisms have been made, with positive results for a range of employee, organisational and economic outcomes.

2.4 Where does just culture come from?

2.4.1 The makings of a blame culture

With the industrial revolution, economic and social environments began to change rapidly. Power-driven machines replaced hand tools and achieved astounding productivity results (Mokyr, 2011). Though there was a good understanding of the equipment designed to maximise production efficiency, there was less understanding of those who facilitated the operation and how they needed to be managed. Unlike previous economic arrangements, in which work was predominantly carried out by experts in their trade, the majority of workers were now unskilled (Berlanstein, 1992) and operating new technology within an increasingly complex system. Coupled with an ever-growing need for efficiency and cost saving (Lucas, 2004), this new environment served as a breeding ground for accidents (Muntz, 1932). The laws of this era meant there was no incentive for employers to make any attempt to understand serious events in their workplace, because (unless there was a direct cost to the business itself) there was no known benefit in doing so. The workers themselves were viewed as expendable (Mantoux, 2005). Accidents were commonly viewed by the legal system as an individual failing to live up to the responsibility for the conditions of their work (Witt, 1998) and the blame for workplace accidents was placed firmly on the workers’ shoulders. Although the legal system’s subsequent efforts to rectify this achieved significant success
(Factories Act 1833; Priestly v Fowler, 1837), their work also created an unintended by-product: accidents now represented a new type of cost to an employer. As employers, and people in general, still believed that all accidents were the result of human error (or acts of God), workers had now become a problem which needed closer scrutiny.

In the early part of the twentieth century, the work of three individuals came to have a profound impact on the treatment of workers after a safety event for much of the remainder of the period. The first of these individuals was Frederick Winslow Taylor. Taylor remains a pioneer in management theory. His work, *Scientific Management* (1911), revolutionised how industry set out to maximise production efficiency. The second was Herbert William Heinrich; of all the individuals who contributed to safety science in the twentieth century, Heinrich is without doubt the most influential. His work, *Industrial Accident Prevention: A Scientific Approach* (1931), brought industry-changing attention to safety in the workplace and was a major influence within safety science for decades after it was first published. The third individual was Burrhus Frederic Skinner. Widely considered one of the most influential psychologists of the last century, Skinner’s work in the area of behaviourism was considered ground-breaking and his operant conditioning research (Skinner, 1938) remains highly influential today. The reason these three individuals are so important to the creation of a blame culture is not a result of their individual works per se but instead a result of the (often inappropriate) use of their works collectively. At the core of Taylor’s work was the replacement of heuristic approaches with detailed processes based on scientific study. One of the more memorable revelations from Heinrich’s book was the claim that eighty-eight percent of all accidents were the result of human error. Skinner’s work on negative reinforcement gave people the (somewhat misleading) impression that the use of punishment was beneficial in ensuring workers follow processes and avoid accidents. Combined, these three snippets
from the large body of works these men created could be commonly interpreted by organisations as:

1. workers are the cause of most workplace accidents, so therefore
2. detailed processes are needed to avoid human error, and
3. those who fail to follow the processes should be sanctioned.

Industry now was of the belief that scientific evidence existed to both support the blaming of workers for accidents and to demonstrate to regulators that the worker was the cause of the event. Ironically, neither Taylor nor Skinner considered punishment to be beneficial. Taylor believed that the best way to influence the workers to follow processes was through monetary reward (Taylor, 1911). Skinner himself distinguished negative reinforcement from punishment and warned that the latter can be detrimental, as any unwanted behaviour is only temporarily suppressed, while unwanted consequences can emerge as a result of its use (Skinner, 1953). Though Heinrich was not completely against punishment, he largely believed that it was the responsibility of management to prevent accidents, rather than the worker (Heinrich, 1931).

2.4.2 Systems and culture

While general systems thinking had existed in research since at least 1950 (Von Bertalanffy, 1950), it was not until the late 1970s and early 1980s that this thinking began to permeate the world of accidents. The works of Turner (1978) and Perrow (1984) were crucial in helping industry recognise that there was much more to accidents than human error. Reason’s ‘Swiss cheese model’ (Reason, 1990), designed to show that accidents are caused by issues at multiples levels of the organisation, would later help this style of thinking reach a global audience due to its brilliant simplicity. It was also during this period that industries began to look more deeply into the area of non-punitive reporting. Leading figures in the aviation
industry, such as Bobby R. Allen, the Director of the Bureau of Safety of the U.S. Civil Aeronautics Board, recognised that a fear of both legal liability and disciplinary action was stifling the ability of the aviation industry to learn from the accidents they had suffered (Hardy, 1990). To counter these justified fears, in 1976, the Federal Aviation Administration (FAA) introduced one of the first blame-free reporting systems, the Aviation Safety Reporting System (ASRS). As a result of the success of this initiative, other industries soon followed suit in an attempt to create their own no-blame cultures. The term ‘no blame culture’ became a fashionable organisational attribute, particularly in the 1990s (Reason, 1998). However, concerns grew that it was incapable of appropriately dealing with those who wilfully and repeatedly failed to meet safety performance standards (Whittingham, 2012). To address this concern and to minimise the propensity for someone to be needlessly blamed, Reason introduced the concept of a ‘just culture’ (1997).

2.4.3 Just culture in the workplace

The idea of Reason’s just culture was to ensure that people were not needlessly blamed for unintentional errors, while ensuring that those committing intentional violations were held accountable. Reason was one of the first to write about the existence of a blame culture within organisations (Groeneweg, 2018). He recognised that blame was stifling employees’ willingness to report accidents, which in turn was damaging organisations’ ability to learn. Reason also acknowledged a need for accountability, as a culture where no accountability exists might lack credibility, even in the eyes of the workforce (Reason, 1998; Walton, 2004). Some believed that the use of the system narrative alone could become a ‘salvation theme’ which wrongly assumed that systemic failures alone are the cause of error (Pellegrino, 2004). The just culture concept was a major step forward in moving away from blame following an accident. The associated culpability model provided employers with a roadmap to try to achieve a ‘fair’ outcome and provide employees with some reassurance that they would no
longer be unfairly punished. In the health sector, Marx (1997), writing from the background of a lawyer, added to the model the difference between blameless and blameworthy: workers were not always to be judged for rule deviations, but only if their decisions could be seen as ‘reckless’.

The just culture culpability model is now widely used across industries, particularly healthcare. The UK’s National Health Service, as of 2018, remained largely committed to Reason’s work in the area of just culture (NHS, 2018). Though the level of research conducted on workplaces which have adopted a version of the culpability model is low when taking its widespread adoption into consideration, in the cases where the use of the model has been assessed, the organisation has identified an increase in both the level and quality of reporting (Lightizer, 2012; Meadows et al., 2005). However, the works of Meadows et al. also indicated the negative influences that broader cultural issues can have when attempting to achieve a just culture. They pointed out that workplace politics, overly bureaucratic systems, time pressures and hindsight bias can all lead to the misuse of the culpability model and the accident process itself—findings which align with those of other studies (Heraghty, Dekker, & Rae, 2021; Heraghty, Rae, & Dekker, 2020).

Ground-breaking as the works of Reason and Marx were, their processes are dependent on the use of a chain of events accident model. A chain of events approach oversimplifies the complex, tangled causes of any event and excludes the system factors and the non-linear interactions among the events identified (Leveson, 2011). The decisions by those directly associated with the event will all have been influenced by, and are interconnected with, decisions and actions by other actors deeper within the system (Rasmussen, 1997; Skyttner, 2005). By reducing an accident to individual components, the process, as a result of hindsight bias and the deep-seated tendency for accident analysis authorities to attribute misbehaviour to character rather than situational factors, becomes a joining of the dots exercise to find the
culprit (Henriksen & Kaplan, 2003). The process naturally becomes person-centred, because behind every action is a human. This has other ramifications, as person-centred processes tend to de-prioritise engineering solutions, and instead rely on education and disciplinary action (Holden, 2009). Metaphorical Band Aids are placed over misdiagnosed problems, which instead require significant surgery if they are to be avoided in the future.

Any culpability tree judges the actions of those involved retrospectively. Through the encouragement of retrospective accountability, a culture where blame plays a prominent part often emerges (McCall & Pruchnicki, 2017), as the intent of retrospective or retributive justice is to fulfil one’s moral duty by punishing the wrongdoer (Cahill, 2007). As the entire process uses a reductionist approach, a worker can be unfairly deemed to have wronged the organisation when the event actually occurred due to a range of diverse influences. The worker is then held accountable through punishment for their perceived wrongdoing. It has been shown that punishment is sometimes pursued even when it is evident it will provide no future pay-off (Crockett et al., 2014). Punishment is often used by management after an accident as part of a perceived moral duty to hold somebody accountable (Cahill, 2007), even where the action has no benefit for (or might even harm) future safety. There are arguably cases—such as those involving deliberate harm—where retributive punishment is acceptable and perhaps even morally required (Walen, 2016). However, this outcome should not be foreordained at the outset of the accident analysis. Ultimately, although Reason and Marx strived to move industry away from a blame culture, because of their close association with reductionist-style accident processes and retrospective accountability, their approaches to just culture still allow a blame culture to breathe.
2.5 Evolving the just culture process through a systems and restoration approach

2.5.1 A focus on systems: creating a more fertile landscape for learning

Since the inception of the just culture idea, concerns have been raised that its original incarnation does not do enough to achieve fairness for the individuals involved in accidents or to help create a learning culture for the organisations using it. The approach to analysing accidents is a critical aspect of this, as it is the information attained as part of the accident report which helps determine the culpability of individuals. Linear-style analysis techniques such as root cause analysis, or methods based on Reason’s linear ‘Swiss cheese’ (such as the Incident Cause Analysis Method ICAM) remain common in a range of industries (McNab, 2020). Safety science has long argued that accidents cannot be analysed using a linear-style approach (Leveson, 2011; Qureshi, 2008; Rasmussen, 1997) as they are an emergent property of a multitude of non-linear, interconnected and interdependent interactions within the organisation’s system (Fan et al., 2015). Instead, the use of a systems approach is encouraged to better learn from events which caused harm or were likely to cause harm. Whereas chain of event techniques such as root cause analysis tend to focus on a search for broken individual components, a systems approach provides a more holistic assessment of the entire system’s interfaces and the interactions between them (Waterson et. al, 2015). A systems approach allows an organisation to see the wood for the trees (Goh, Love, Brown, & Spickett, 2012; Goh, Love, Stagbouer, & Annesley, 2012) and focus less on human behaviour and more on the system problems which influenced the behaviour. When compared with the ‘root cause analysis’ technique, the systems approach was found to highlight a far larger group of issues and a much broader set of actions, all of which helped create a greater understanding as to how the accident occurred (O’Neil, 2014). Using this approach, a culpability model where ‘Who did it?’ and ‘How guilty are they?’ are key questions, would be less appealing to
organisations which wanted to reduce accidents and improve safety. System accident models, such as AcciMaps (Rasmussen, 1997), The Functional Resonance Analysis Method (FRAM) (Hollnagel, 2012) and Systems Theoretic Accident Model and Processes (STAMP) (Leveson, 2004) all delve much deeper into the functioning of the organisation and how it influenced the accident to occur, rather than viewing the event as standalone. Due to the wider scope of these models, it would be not only workers and supervisors having their actions run the gauntlet that is the culpability model to determine their blameworthy, but business leaders as well, given the influence their decisions had on the actions of those on the front line. While in some cases there may be a call for high-level culpability (such as where it is perceived that leaders have evinced callous indifference to system-wide risk to employees and third parties), this is neither the intention of a system accident model nor beneficial for future organisational learning. It may even result in an increase in defensive practitioners across the organisation and a subsequent increase in the potential for a serious event. The perceived risk to job security would encourage frontline operators to become better at hiding events (Health Quality Ontario, 2017) and senior personnel to minimise reputational damage through increased bureaucracy. Though the systems approach focuses on improving the system to meet the needs of its users, its motive is not to avoid accountability being achieved.

2.5.2 Accountability which supports collaboration and learning
In place of traditional retrospective accountability, prospective accountability (DeVille, 2002; McCall and Pruchnicki, 2017) would instead be used to deal with the safety issues where the outcome or potential outcome was unintentional. Instead of asking, ‘Who is at fault and how do we fix them?’ the question becomes, ‘What are the problems we have found and how do we solve them?’ Accountability becomes less about people management and more about risk management. Retributive justice mechanisms would remain only for those who intended to inflict harm. Instead, those who were directly involved in and those who influenced the event
would be held accountable not through punishment but by the requirement to provide their account (Dekker, 2012) and to support the creation and implementation of the agreed solutions (Sharpe, 2004). The decisions and actions taken to achieve justice would be less retributive and more restorative.

2.5.3 Acknowledging the victims

When an accident occurs, it is both individuals and organisations who suffer. The individuals injured or harmed in the event can suffer a great deal. This suffering is not only of a physical nature but can also manifest psychologically, through issues such as depression, anxiety and post-traumatic stress disorder (Kellezi et al., 2016). A second victim (Wu, 2000) is a person who was (on some level) causally involved in an accident for which they feel personally responsible. Whereas the first victim is rightfully looked after post-event (though this is unfortunately not always the case) (Skarlicki et al., 2017), the second victim is less fortunate. In many cases, the second victim is viewed as the primary cause of the accident and is on the receiving end of some form of blame or is subject to guilt and self-blame (West et al., 2006). Without the right support and guidance, these individuals may never truly recover. Where treatment has not been received, these second victims are much more prone to mistakes (West et al., 2006). The third victim of any accident is the organisation. When an accident occurs, there is a significant chance that its reputation will suffer (Mira et al., 2017). Organisations not only face immediate consequences but are also susceptible to a snowball effect. Where the organisation has suffered multiple accidents in which the second victims were treated poorly, an increased number of their employees may become defensive practitioners to avoid future blame (Sekhar & Vyas, 2013). This can lead to an increase in the cost of production and a decrease in quality outcomes (McKellan, 1996). It can also significantly reduce the willingness of workers to report safety-critical issues (Khatri et al., 2009; Waring, 2020). An organisation is likely to experience problems in areas such as
employee motivation, engagement, performance and turnover where there is a perceived loss of trust or support on behalf of the employee (Heraghty, Rae, & Dekker, 2020; Menezes et al., 2013; Schein, 2010; Shin, 2019). Prospective employees are more likely to avoid organisations where blame is known to be prevalent (Cable & Graham, 2000). Innovation is severely hampered as employees are no longer willing to try anything new for fear of blame should it not work (Hernandez-Mogollon et al., 2010). Creativity becomes non-existent as the workplace is no longer an environment which is conducive to the free flow of ideas (Baas et al., 2008). Though these three victims are the most visible of any event, it is also important to remember that they are not the only ones. Family members and friends of those who have suffered can also legitimately be considered further victims and also need considering (Coughlan et al., 2017).

2.5.4 Justice through restorative mechanisms

Minimising the impact on the victims and helping them restore what has been lost as much as possible is where the focus should be after an accident has occurred. Mutual trust between stakeholders is often at a low ebb following an accident (Gillespie & Dietz, 2009; Lazo, 2016; Miyawaki & Sasaoka, 2017). It is crucial that this is addressed as early as possible to avoid this reduced level of trust becoming the norm. Both the physical and psychological needs of the individuals involved must be attended to after the event and support must be continued for as long as it is needed (Chu et al., 2019; Stewart et al., 2015). Where a person has been unintentionally injured, forgiveness must be sought by those involved who inadvertently caused the harm (Hare, 1991). While in some cases the victim may be unable to offer full forgiveness, the offer of apology alone can help with the healing process for all parties (Braithwaite, 2016). The process ensures that the damage caused to the victim (or their family) is fully acknowledged and appreciated, while those who feel responsible for the accident are given a platform to express their remorse to the injured party, which itself can be
a cleansing experience (Crigger, 2004). Full disclosure from all parties involved is necessary as it serves to help the organisation to learn (O’Connor et al., 2010) and can contribute to restoring the sense of integrity of those who provide it (Schiess et al., 2018). Often, full disclosure can only occur where there is no potential for blame or punishment (Ozeke et al., 2019). Restorative justice practices can be important in such cases, as individuals who were causally involved in the accident may feel the need to express remorse and apology even when there was no wrongdoing involved.

In cases where a level of wrongdoing has occurred, restorative justice mechanisms can be critical. In such cases, it can be vital to acknowledge to victims not only that they have been injured, but also that they have been wronged—perhaps by a single individual, or a group of disconnected individuals, or even by the system itself. After all, forgiveness is most appropriate in cases where there is at least some level of wrongdoing that has been committed.

Once all involved have been allowed to tell their stories, the future needs of the organisation require addressing. It is important to note that organisational needs are not completely separate from the needs of the individuals. Through the provision of support for those involved, these individuals can become more resilient in the face of future adverse events, which in turn allows the organisation to become more resilient (Santomauro et al., 2014). To determine the actions needed for each of the issues faced by the organisation, it is crucial that the actors who played a part in the event are involved in the decision making. This is required for several reasons:

- The organisation achieves accountability through holding those involved to account by ensuring they support the repair of the damage caused by the event they unintentionally influenced.
Those involved gain some closure on the event by helping to ensure that the issues they faced prior to the event will be less likely to reoccur and by seeing the organisation take action.

The actions determined are more aligned with both the needs of the business and the needs of those who do the work (Heraghty, Dekker, & Rae, 2021).

Using this mechanism of just culture, both justice and accountability are achieved in a forward-looking manner (Sharpe, 2004) focused on fixing the issues identified. This style of approach has been shown to improve employees’ sense of empowerment, which in turn leads to greater learning within the organisation (Heraghty, Dekker, & Rae, 2021) and increased cost savings (Kaur et al., 2019).

2.6 The limitations faced by all mechanisms seeking to achieve a just culture in the workplace

2.6.1 A misunderstanding of the relationship between safety and culture

Although a restorative approach to just culture is a step in the right direction, it too is faced with deficiencies that can have a detrimental impact on its intended goals. It is not the approach itself which creates these deficiencies, but rather where the term ‘just culture’ resides, from both an academic and an organisational context. When the term first emerged, it was described as a component of a safety culture (Reason, 1997). It was deemed one of five essential factors essential to achieving safety within an organisation. The concept of a safety culture has been discussed across industry for decades, one of the earliest references appearing in the International Nuclear Safety Advisory Group’s (INSAG) summary following the Chernobyl accident (Guldenmund, 2010; Yorio, 2019). It is most often referred to as a set of safety related values and beliefs that exist within the organisational structure that influence safety-focused decision making (Uttal, 1983). Subsequent reports carried out on major
disasters such as Chernobyl (IAEA, 1986), the Challenger space shuttle disaster (Feynman, 1988; Vaughan, 1996) and the Piper Alpha disaster (Cullen, 1990) all discussed deficiencies within the safety cultures of the respective organisations and how this helped create the environment for these events to occur. Though the term was well-intended, it has inadvertently led to safety being described as a discrete entity within organisations, rather than one of many emergent properties of the organisation’s system (Yang et al., 2017). The safety culture of an organisation was thought to be a subculture of the organisation’s culture (Reason, 1997), which led to just culture being placed in the same silo. However, the idea of safety culture as a subculture is itself flawed, as organisational subcultures tend to be departmental, occupational and geographical (Black, 2003). That is, there is not a distinct subculture concerning safety—instead, there are safety outcomes that arise from a myriad of organisational features, qualities, norms, practices and processes. The safety culture of an organisation has thus been referred to as a focused aspect of the organisational culture (Richter and Koch, 2004), which implies that it is not a culture at all but is instead an understanding of how an organisational culture impacts safety outcomes. It has even been argued that the dominating discussion around safety culture and its importance goes against sociological and anthropological theories of culture (Gould, 2021; Silbey, 2009). All of this has ramifications for the current approaches to just culture, as the idea that just culture is a component of the safety culture has meant that it is seen as a separate entity to the organisation’s justice system in most organisations.

2.6.2 The need for a just organisational culture, not a just safety culture

Organisation justice is a concept that represents employees’ perceptions of fairness within their own workplace (Kim & Chung, 2019). Even where a just safety culture is implemented according to the correct process and in good faith, perceived negative treatment of the workforce outside of this safety process can be extremely damaging to its intent. The ideals
of a just culture can only truly have their desired impact if they are embedded within the organisation’s justice system and culture. To create the trusting environment required to achieve a learning culture, the treatment of employees must be consistently applied across all aspects of the organisation (Saunders, 2003), and not just when a negative event has occurred. Problems in areas such as performance management, promotions (Cathleen et al., 2010), day-to-day treatment by those with decision-making power (Frazier et al., 2010) and the level of transparency around decision making (Greenberg & Baron, 2008) can all damage the trust needed to ensure critical information is shared. This point is well-known across the broader organisational literature, which notes the relationship between ethical outcomes and employee perceptions of fair treatment in general matters, such as layoffs, appraisals, promotions and executive perks (Treviño et al., 1999).

To attain the desired justice outcomes consistently, the organisational culture must embody the core attributes of the process. The just culture process itself would then be viewed as a reflection of the organisation’s culture and serve as one of many mechanisms within the organisation’s system which help to sustain the company’s ethos. Doing all of this would help significantly in the pursuit of fairness, trust and learning, but it must be highlighted that organisational cultures themselves do not operate in a vacuum. There are other factors that can also both influence perceptions of fairness and individuals’ reactions to mistakes.

2.6.3 How society influences organisational behaviour

National cultures and the values and beliefs they espouse have been shown to have a profound influence on organisational culture (Nazarian et al., 2017). The public judicial system to which individuals are exposed in their everyday life is likely to influence their beliefs about how justice is to be achieved, as this is their social norm (Hofstede et al., 2010). Society’s norms influence decision making and human resource management practices (Li et al., 2001; Wilmott, 2000). Where people are exposed to retributive justice mechanisms
following a deviation from a societal rule, they may believe that restorative practices in the workplace following a rule deviation are unfair, as these practices are not consistent with how they are treated outside the organisation. An example of this is where those who are fined for speeding believe punishment for workplace mistakes to be fair, as this is the social norm for them (Heraghty, Dekker, & Rae, 2021). Principles of justice within the workplace that are inconsistent with cultural values often struggle to be accepted (Birnbaum-More & Wong, 1995). This can be the case particularly with managers, who often use punishment as a means of restoring a sense of social justice within their organisation (Skarlicki et al., 2017). If punishment is the most common means of dealing with rule deviations within the manager’s society, they will naturally gravitate to this to manage their own area of control. For organisations to attain some form of success in the implementation of their desired culture, they must first gain an understanding of the respective national cultures of their employees and local perceptions of fairness so that they may create an informed implementation plan.

2.6.4 Our understanding of the story depends on the language we use

Regardless of the problem, there is always the human desire to seek simple explanations so that they may swiftly solve the issue and once again have a full understanding of their world (Hollnagel, 2009). This itself can lead to what is called ‘binary opposition’ which can lead to binary language being used to tell the story (Vesel, 2012). The use of binary language is believed to result in a culture of judgment and blame (Woods et al., 2010), as it disregards the greyness of our world and only sees right or wrong and black or white. The language used, and the associated linguistic framing can shape cultural approaches to areas such as justice and this in turn can then permeate an organisation’s culture. Some languages are much more agent-focused than others where they are referring to unintentional events. For example, English speakers are more likely to focus on the human when describing an event than Japanese speakers, simply because the English language uses a higher volume of
agent-focused expressions (Choi, 2009; Fausey et al., 2010). Different languages can generate different frames for the same event because of their different framing patterns, leading to different stories being told (Gentner & Goldin-Meadow, 2003; Maas et al., 2006). Studies have shown that using the active verb in a sentence is more likely to result in the assignment of causality and blame (Rudolph & Forsterling, 1997). The structure of a sentence can often give the reader a misleading belief of the causality of the situation (Vesel, 2012). The ‘active voice’ in particular can give a sense of control and causation that the passive voice cannot (Knobloch-Westerwick & Taylor, 2008). Stories of events which use more agent-based language can trigger more human-focused actions and requests for punishment than those in which non-agentive verbs form the majority of the story (Fausey and Boroditsky, 2010; Heraghty, Dekker, & Rae, 2018; Thibodeau and Boroditsky, 2011). The type of language and framing used as part of accident analyses can also heavily influence the approach of the facilitator. For example, the term ‘human factors’ is often found to be misinterpreted by accident facilitators (Vesel, 2012), which can then influence their approach to accidents. A misunderstanding of the term can lead to the accident analysis facilitator attempting to find conversational strategies that focus on the human’s actions (Koralija & Lundberg, 2010). The process itself and how it is written can also influence the facilitator’s approach and lead them to write a report biased towards the humans involved (Vesel, 2012). One example provided by Vesel is that many accident processes request the event be described, something which will naturally place more focus on humans as they are always last in the chain. To gain an understanding of the system problems, the story would need to capture much more beyond the event itself. The term ‘facts’ is commonly used within accident processes and reports. It exists within reports to indicate to the reader that this information is the unquestionable
reality of what occurred. Yet Gergen argues that ‘reality is a constant negotiation of meaning between individuals and there is no real world but the one we agree exists through social construction (2009). Understanding how to minimise agentive framing within storytelling is critical when the goal is to create an environment in which blame does not become a natural emergent property of everyday discussions regarding workplace problems.

2.7 Conclusion

2.7.1 Ethnographic study on safety in the construction industry
In recent years, there has been a gradual increase in the number of ethnographic studies in the construction industry (Pink et al., 2012) and those with a focus on safety and safety-related topics. The use of ethnography can prove particularly beneficial in studying a construction site as this is a highly complex environment and an ethnographic approach can contribute to deeper insights into the ramification of socio-cultural systems by the capturing of significant variations, contradictions and tensions (Löwstedt & Räisänen, 2012). It can also be a powerful way of illuminating construction practices in different ways (Gherardi & Nicolini, 2002; Pink et al., 2012).

One of the area of focusses of this study is that of learning and how it is influenced within a construction organisation. A learning culture has long been deemed a requirement for safety to be achieved consistently (Reason, 1997). Prior to this study on accident analysis and its impact on learning, there have been several ethnographic studies which have analysed methods of learning in the construction industry and how they are both influenced and impacted. Gherardi and Nicolini (2002) showed that the distinct communities and cultures which exist on a construction site, their practices and the power relations between these groups can produce tensions, discontinuities and incoherencies as often as they produce
positive outcomes. Furthermore, the short-term, temporary nature of a construction site means that it cannot rely on structuring processes akin to organizational memory. In their work as an embedded worker on a construction site, Löwstedt (2014) highlighted that practices within construction are embedded in both the culture and the industry-specific circumstances and these practices can only be explained by understanding both of these. The differences between what was supposed to happen and what actually happened and why individuals’ decisions and actions made sense to them are critical aspects of a successful accident analysis. Several ethnographic studies in the construction industry have been able to shine a spotlight on the distinct difference between the plan created and the reality once this plan or process required implementing, as well as the challenges faced by both the employer and the employee. Rooke (2005) found that plans and processes that do not align with experiential knowledge will meet significant resistance and may fail to fully address the risks faced, while impacting methods of learning on site. In their study on rule violations on a construction site, Iszatt White (2007) found similar issues to those found by Rooke and showed these disparities between the system and the reality of the situation left the worker exposed through the need for rule violations, a finding which is important for accident analysis as workers are often held accountable in hindsight for rule violations. They also indicated that where this gap exists, the rules, when implemented, can result in the creation of additional risks, with the requirement for ear defenders to be used on a live road used as an example.

The safety professional plays a vital role in any accident analysis as, more often than not, they are the facilitator of the process. Their understanding of accident analysis and their approach any event can heavily influence the outcome. While conducting an ethnographic study on the safety profession, Provan (2019) found that there was a significant gap between safety professionals’ practice and the safety science research. This finding is significant for
this study as to implement a restorative accident process, there is a need for those facilitating
the analysis to be aligned with the system.

There have also been ethnographic studies in the area of accident analysis. Through their
study on this topic in the construction industry, Oswald (2015) showed that accident analyses
often stop before they are able to unearth what they referred to as “unsafe acts” and what are
now known as the symptoms of system issues (Leveson, 2011b). Though ethnography has
been used to delve further into accident analyses, there is little to be found that uses it to gain
the perceptions of the process itself, why the process exists and what impact all of this has on
learning. This study will build upon the work of the authors mentioned in this section to
provide a deeper understanding for the reader, and a different view, of the accident process
and its purpose.

2.7.2 Theoretical framing

This thesis applies three theoretical frames:

1. A theory of retributive justice
2. A theory of restorative justice
3. A theory of language and framing

The first theory applied within this study is that of retributive justice. Wenzel and Okimoto
(2016) define retributive justice as:

“The subjectively appropriate punishment of individuals or groups who have violated rules,
laws, or norms and, thus, are perceived to have committed a wrongdoing, offence, or
transgression.”

Within this study, the theory of retributive justice is used in the context of Daly’s work
(2016), where it is not a justice type, but a part of the conventional or traditional justice
approach. The reason being is that there are many aspects of this approach and retribution is only one of them.

This theory was selected as retributive aspects were embedded within the focus organisation’s original accident process and it was necessary to compare both this theory and that of restorative justice to understand the positive and negatives which emerged as a result of the accident process modification. Previous research has shown, in addition to that mentioned within Section 2.4.3 regarding the weaknesses of a retributive approach, that processes containing retributive elements can often be inconsistently applied due to office politics (Vaden, 2004), leading to workplace fear and lack of productivity. This was highly relevant to this study as when discussing a question focussed upon learning, it was important to look beyond the traditional safety areas such as accident reporting and disciplinary action.

The second theory applied is restorative justice. An apt description of this theory is given by Marshall (1996):

“A process whereby all the parties with a stake in a particular offence come together to resolve collectively how to deal with the aftermath of the offence and its implications for the future”

For the benefit of this study, Daly’s theory (2016) that restorative justice is not a type, but a mechanism used to achieve justice, is adopted.

This theory was chosen due to the evidence available showing the positive influence this theory can have upon learning, something this thesis sets out to understand in an accident analysis context. Previous studies in school environments have shown that an introduction of an approach using this theory can positively impact peer accountability, engagement and the meaningfulness of actions (Weaver & Swank (2020). Given the benefits listed are all elements needed for a learning culture, this theory was the logical choice to help answer the
main question of this thesis. Another reason for its selection was the fact that it has now been adopted by some regulators under the banner of an ‘enforceable undertaking’, whereby the employer is held accountable by the regulator not through a fine, but by providing a system-wide solution to the problem found. The perceptions of employers of this process were that it was much more beneficial than the standard punishment approach (Johnstone & Parker, 2010). Injecting this theory into the accident process would provide the employer’s perceptions as the owner of the process, rather than the participant. Many authors have spoken of its benefits to safety (Dekker, 2014; McCall & Pruchnicki, 2017), and its use here would add to this conversation.

The third and final theory applied was one of language and framing. The theory used is that of Thibodeau and Boroditsky (2013) which states that:

“Metaphorical frames can play a powerful role in reasoning because they implicitly instantiate a representation of the problem in a way that steers us to a particular solution.”

It was the work of Thibodeau and Boroditsky that influenced the testing of this theory within this thesis. The accident process and its associated report have a significant impact on organisational justice, and it was important to understand how much of a part language and framing plays within these. Previous research in associated areas have all shown the power language has upon the process facilitator, the participant and the decision makers. Within the police force, the requirements of the investigation process can sway the manner in which the police report is written (Cetkovic, 2017). The choice of language within police interviews and how the conversation is captured can impact both the interview itself and the subsequent report (Oxburgh et al., 2006; Byrman & Byrman, 2018). In the court setting, the language and framing applied by prosecutors has been shown to have a strong effect on the jury’s subsequent decision making (Conley, 2015). Like the examples used previously, the accident process also has process and report facilitators, process participants and decision makers who
determine actions based on the information provided. This made this theory highly suitable to this thesis.

2.7.3 Final conclusion

Achieving a culture where trust and fairness are well-embedded properties requires systems thinking, prospective accountability and reparation of harm through restoration all to be firmly embedded in the organisation’s approach to work and to its people. It is not enough to have a just culture process which only deals with safety events, as trust is created and lost during everyday work and the decision making involved, not just when accidents occur. It is important for those who aspire to influence organisational culture to recognise the impact the language, values and beliefs of organisational teams have on the culture and to seek to understand these elements and their influence before attempting any change.

It would be unwise not to recognise that the implementation of this type of culture is more difficult where the national judicial system and the language used are not aligned. That said, nothing stops an organisation from treating its own people with more respect, fairness, and understanding than external stakeholders would. Indeed, this should not deter organisations from taking this approach. The integration of restorative mechanisms into the workplace judicial system remains a significant step forward from cultures in which blame and retributive justice mechanisms are the norm. Where the workplace judicial system has evolved from a retrospective accountability approach to one which seeks to attain accountability in a prospective manner, this has resulted in less of a fixation on the human, increased willingness to participate, a greater sense of individual empowerment, and actions that are both sustainable and more relevant to the actual problem. Of all the alternatives which exist today, this approach remains the most humane for those exposed to it and the most beneficial for organisational culture and learning.
Chapter 3: THE INFLUENCE OF LANGUAGE AND FRAMING

Statement of contribution of co-authored paper
This chapter includes a co-authored published paper. The owner of the copyright, MDPI, grants permission for all authors to include their own article within their thesis or dissertation. The bibliographic status of the co-authored paper, including all authors, is:


This paper has been lightly edited for spelling and grammar to ensure consistency with the rest of the thesis document.

The primary author of this paper was Heraghty. Both Rae and Dekker served in the role of supervisors and were active in the conceptualisation, methodology and review stages. Rae was also active in the data analysis stage, serving as the 2nd reviewer.
3.1 Rationale for the study

While planning the modifications for the accident process and determining the necessary adjustments needed to maximise the ability to learn, I began to query how much influence the language and framing used throughout the accident process had on the reader of the report and their decision making. The standard language used within safety processes, including the accident process itself, is not dissimilar to legal terminology—something which should not be a surprise, given that safety management systems are heavily influenced by safety law and regulations. Though I had been aware of the influence language had within the process itself due to the research unearthed as part of my literature review, I was also keen to understand whether a change in the language and framing alone of an accident report was enough to change the focus of the corrective actions.

Influenced heavily by the works of Lera Boroditsky, which show that fear-inducing language and framing increase the likelihood of harsher actions in society, I wanted to know if different accident styles achieved different outcomes. There are many different accident analysis approaches and techniques in industry, and I believed it was important to know how much the approach used influences the actions taken and their focus. As a safety professional, I always had the suspicion that, although the safety professional is not the person to issue punishment following an accident, we are the ones who inadvertently load the bullets, through our storytelling methods. This research was designed to allow me to determine if this belief was valid.

This paper sets out to help answer the following sub-question:

**Sub-question 1.1.2 - What impact, if any, does language have on decision making following an accident?**
3.2 Abstract

The language and approach we use to describe the past can have a strong influence on the audience’s interpretation of our story. In our experiment, we explore, using three different conditions, how the framing, language and style of an accident report can affect the audience’s proposed solutions to manage the problems found. We find that the approach used to create an accident report can have a powerful influence on the audience’s decision making. Whether we are describing an accident in a linear manner, or using a systems approach, or accepting multiple stories that are not linear or coherent, the methods we use to capture and communicate the story have a profound impact on the actions decided on by the reader.

3.3 Introduction

How stories are framed can greatly influence the reader’s interpretation of the event and the actions taken as a result. The analysis of accidents and the accident report style used to share the story provides a prime example of this.

The language we use to tell a story can have a profound effect on how the listener or reader interprets the story. The power of language and metaphors is showcased in the work of Thibodeau and Boroditsky (2011) who presented participants with different descriptions of the same fictional city suffering from a surge in crime. Their study sought to understand how metaphors shape understanding and reasoning, and whether the use of different metaphors to describe crime would lead to the proposal of different solutions. Their results showed that when the word ‘beast’ was used to describe crime, the proposed solutions were much more likely to be enforcement-based, while when the word ‘virus’ was used to describe crime, the proposed solutions became much more social-reform based.
The influence of the English language on our thoughts and actions, as distinct from other languages, is also worth considering. In the description of accidents, the English language consistently uses the agent of causality to describe the event: “John dropped the vase”. Conversely, when describing accidents in Spanish or Japanese, the agent of causality is dropped: “The vase broke itself” (Boroditsky, 2011). Other research has also highlighted the effect different language has upon the area of focus (Choi, 2009; Fausey et al., 2010). This showcases how those of us who speak the English language are more likely to naturally focus on human error because of our instinctive way of describing the world we see. When this is refined to how we normally hear about accidents, which is usually in a headline format to keep it sharp and simple, the accident becomes more about the individual than about the system issues which have led to it occurring. Studies have shown that using the active verb in a sentence is more likely to result in the assignment of causality and blame (Rudolph & Forsterling, 1997). The structure of a sentence can often give the reader a misleading belief of the causality of the situation (Vesel, 2012). All of this can often unintentionally assist the creation of a blame culture and can have a serious impact on an organisation’s ability to learn.

Although the world of academia has generally accepted that most industrial accidents occur due to complex system issues (Rasmussen, 1997) and that human error is a symptom of a larger problem within the organisational system (Reason, 2000), many organisations, and indeed society as a whole, remain deeply focused on the frontline operator after an accident has occurred. Many accident reports still cite human error as a primary cause (Johnson, 1999). Reports for notable accidents, such as the Bhopal chemical plant accident (Morehouse & Subamaniam, 1985), the Herald of Free Enterprise accident (Sheen, 1987) and the Kegworth air crash (Air Accidents Investigations Branch, 1990) have all highlighted human error as a key factor in the accident’s occurrence. All three of these accidents are still used
within the safety training curriculum as examples of how things go wrong today. This leads organisations to believe that it is the operator who is the main contributor to accidents, and it is the operator who is the problem within their system which requires rectification. Today, almost every accident is followed by questions focused on ‘Whose fault?’ (Dekker, 2009). It seems as if every accident must be charged to somebody’s account (Douglas, 1992). This often results in someone being blamed and punished for an accident which was essentially created by complex system problems that arose from various relationships and interactions within the system (Leveson, 2004).

The use of punitive or blame methods to manage mistakes or errors can be not only harmful to the worker (Wu, 2000) but also to an organisation’s learning ability (Ruitenberg, 2002). Workforces are much less likely to report mistakes for fear of retribution (Chapman, 2009; Merry & Smith, 2001), creating an organisational culture where a chief executive officer (CEO) only learns of the problems within their organisation after a person is seriously injured. Using punishment to deal with error is likely to create a culture where the workers resent the very system that was supposed to enable them to work safely because it uses them as the sacrificial lamb to appease society when something goes wrong. The greatest impediment to learning from mistakes is the use of punishment (Leape, 1994), as a system cannot function well if it punishes those who make mistakes while also trying to maintain a learning culture (Dekker, 2002) that depends on people being open and honest when an error is made.

To counter these harms within our systems, the use of restorative mechanisms has been promoted as a more beneficial alternative to manage failure in the workplace and to achieve justice. Rather than continuing to use solely retributive mechanisms that will create long-lasting workplace wounds, the use of restorative mechanisms is proposed as a means of “addressing the harms that have been done and addressing the causes of these harms” (Zehr
& Gohar, 2002, p. 31). Using this approach, the line of questioning following an accident would no longer be who is responsible, but what (Dekker, 2012), and how can we fix the issue, not the person. The restorative principles, particularly those put forward by Zehr and Gohar, are aligned with the work of Albert Wu and his Second Victim Theory (Wu, 2000). Wu’s theory highlights the impact an accident has on those who feel personally responsible for the accident’s occurrence and the need for organisations to help these individuals to recover from their mistake, rather than vilifying and ostracising them.

The accident model and writing style chosen by the accident analysis facilitator play a critical role in the level of learning achieved by an organisation following an accident. Different languages can generate different frames for the same event, leading to different stories being told (Gentner & Goldin-Meadow, 2003; Maas et al., 2006), and the accident reporting style chosen can further define the story being heard. There are many accident models available today, with several having contrasting styles. Some follow the root cause analysis approach, where the use of reductionism can often lead to the conclusion of some form of human error. Other models are more systems-oriented, placing the focus more on system relationships and emergent risk. For the accident facilitator, “what you look for is what you find” (Hollnagel, 2014, pp. 154-155). If one is looking for someone to blame, they are easily found, particularly in hindsight. The style of model used may also dictate the information provided to the reader. For an organisation deciding on the actions necessary to prevent a similar occurrence, “What you see is all there is” (Kahneman, 2011, p. 86). The reader’s understanding of the event and their opinion of the actors involved is heavily reliant on the information provided within the accident report and the framing and language used by the accident facilitator.

In this paper, we empirically analyse whether using different metaphors and writing styles to tell the accident story leads the reader to focus on different aspects of the accident report and
to propose different solutions. Will the solutions vary in line with the writing style? Will the metaphors used encourage people to reason about the event in a consistent manner with the underlying perception of these metaphors? For example, if we use language which is consistent with how law enforcement describes a crime, will people treat the event in a similar manner to how crime is dealt with in society? Will the focus of the accident analysis facilitator and their chosen facts influence the reader? Or if the event is told in a way which is aimed towards a learning outcome, will the solutions proposed be consistent with the aims of the storyteller?

3.4 Materials and methods

3.4.1 Participants

For this experiment, we used a sample population of 93 people, all of whom work for construction companies. The study was issued to the operational staff members of three different companies and the studies were issued in alphabetical order using each organisation’s distribution list. Our sample population included various sub-populations, such as engineers, construction managers, human capital personnel and safety advisors. This allowed us to sample a broad cross section of the production support team. This was necessary as people’s conceptions of workplace accidents may differ depending on their past experiences, their role and their exposure to the accident process.

The data was collected using both paper and online anonymous surveys and there was no incentive to participate. To preserve the confidentiality of the participants, no individually identifiable information, including the participant’s organisation role, was collected.

3.4.2 Materials

The experiment involved three conditions, called “Report Variants”. Each participant was randomly allocated one of three accident reports, such that each report was reviewed by one-
third (31) of the participants. In each of the three reports, participants were presented with a
description of an event which had the potential to cause life-altering harm to a human. Each
report described the same event. The reports differed in their language, structure and style.
Report Variant 1 used a reductionist approach to create a linear story; Report Variant 2
focused on issues existing within the organisation’s system; and Report Variant 3 focused on
the provision of multiple accounts.

The facts included in the reports used were all taken from a real-life accident. Due to the
different report styles used, not all facts were captured in each report. This was natural rather
than forced due to the accident report style dictating the information captured and the way it
was presented.

Each report information sheet requested the participants to review an accident report and
provide three recommendations based on the information provided. The heading above the
three blank boxes provided asked the participant to identify preventative/corrective actions.

Participants could access the report and submit their response in either paper or electronic
format.

3.4.3 Conditions

3.4.3.1 Report Variant 1

The search for human error following an accident has long been a goal of many accident
analysers. One of the factors which greatly increased the focus on human error following an
accident was the event that occurred at Three Mile Island (1979) and the use of the label
‘human error’ in the subsequent report (Woods, Johannesen et al., 1994). The spotlight on
human error within the world of accident analysis has intensified in recent decades because of
human error-focused research, such as that in Stanton and Glendon’s work on individual
attitudes to risk taking (Stanton & Glendon, 1996). This led those within the field of accident
analysis to spend a disproportionate amount of time on focusing on human issues and viewing them as the main cause of accidents. Another influencing factor in industry choosing this trajectory for the analysis of accidents was the work of Heinrich, who declared that 88% of all accidents are the result of human error (Heinrich, 1931). A key problem with focusing on the symptoms of human error is that the underlying causes which helped create the error are ignored (Van Vuuren et al., 1997) along with the weaknesses in the organisational and regulatory system which created the environment for the error (Hale et al., 1997). These less direct forms of human failure help to establish the working practices that result in operator error (Reason, 1997).

The report used for Report Variant 1 was a real accident report written after an accident occurred on a construction project. It was modified only by removing identifying details. The writing style used by the original report’s author is human error focused, with minimal focus on the underlying causes of the errors (Appendix C). In creating the report, the accident analysis facilitator reviewed the interviews of those involved and selected the information they believed to be relevant to the report.

3.4.3.2 Report Variant 2

There are many safety researchers who encourage the operational world to move away entirely from a focus on human error and towards a complete system focus. From this viewpoint, accidents today are much too complex to understand through traditional accident analysis, which aspired to find individual broken components such as human error (Leveson, 2004). System behaviour cannot be deduced from component behaviour (Shorrock et al., 2014) as “simple entities, because of their interaction, cross-adaption and cumulative change can produce far more complex behaviours as a collective” (Woods, Dekker et al., 2010, p. 32).
There are many methods used in the world today to analyse accidents using a systems approach. The Functional Resonance Analysis Method (FRAM) (Hollnagel, 2012), Accimaps (Rasmussen, 1997), Systems Theoretic Accident Model and Processes (STAMP) (Leveson, 2004) and Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis are just some of the processes used to better understand complex accidents.

The report used for Report Variant 2 was based on the same accident used for Report Variant 1. This report was written by the first author for this experiment and contains information which was not included in Report Variant 1 because of the writing style chosen. This additional information is also factual. Participants were provided with a one paragraph summary of the accident followed by a SWOT Analysis of the five elements deemed necessary to achieve success (Appendix D). These elements were: daily activity briefing, personnel, tools and equipment, work environment, and task execution.

3.4.3.3 Report Variant 3

Traditionally, accident reports consisted of a singular narrative describing the event. The role of the accident analysis facilitator was to objectively collate the facts related to the event and to provide a story for others to better understand what happened and how. The accident analysis facilitator would choose what they believed to be the important aspects from each statement of those involved in the event and use this information to create a linear story. A key failure in this approach is that it is impossible for the facilitator to avoid hindsight bias using this method, given that they are aware of the outcome of the event. Hindsight allows observers to change past indeterminacy and complexity into order, structure, and oversimplified causality (Reason, 1990). The facilitator regularly omits background information within each actor’s story from the final report to help create the story they believe to be true. This story is often littered with counterfactuals highlighting what the
operators could or should have done. However, saying what people could have done to prevent a specific outcome does not explain why they did what they did (Dekker, 2002).

The report used for Report Variant 3 communicated the same accident as Report Variants 1 and 2. This report, written by the first author for this experiment, used the ‘multiple stories’ approach (Appendix E). This report, like Report Variant 2, contains information which was not included in Report Variant 1 because of the writing style chosen. This additional information is also factual. Each actor’s account was recounted verbatim in the final report to ensure everyone’s voice was heard, whether conflicting or not, and this became the accident report. The issues and constraints faced by those involved and captured in their story were listed as contributing factors to the accident.

3.5 Results

Overall, there were 298 corrective actions proposed by the participants across the three conditions: 99, 100 and 99.

3.5.1 Coding

Proposed corrective actions were coded into two categories: (1) human/blame-focused and (2) system-focused. Each category was further broken down into subcategories. The human/blame-focused category was divided into the following groups: (1) punitive action against the people involved; (2) non-punitive action focused on the people involved (e.g., training, reinforcement of correct behaviour). The system-focused category was divided into the following groups: (1) one-off actions, such as communicating about the accident or reviewing the risk register considering the accident; (2) changes to the physical workplace; (3) reinforcement or change to the work practices specifically involved in the accident; (4) reinforcement or change to practices not directly involved in the accident; and (5) changes to
documents. A separate category was provided for any counterfactual statement found. This category was then separately coded using the two main categories.

Each participant’s response was weighted equally, as a single point towards the analysis. Participants’ corrective action suggestions were coded blindly by two coders. Cronbach’s Alpha—a measure of reliability—was 0.957759, indicating good agreement between the coders. The coding made by the first author was used for the remainder of the analysis.

3.5.2 Findings

Overall, participants were more likely to propose system-focused corrective actions (255 actions, 86.44%) than human-focused (40 actions, 13.56%). However, the actions that participants proposed to manage the issues which led to the accident varied greatly depending on the style of the report, the framing of the story and the language used to describe the event. Participants provided with the traditional approach report were more likely to suggest actions with a human error/blame-focus (27 actions, 27.55%) than those provided with the systems approach report (8 actions, 8%) or the multiple stories approach (5 actions, 5.15%) reports, $\chi^2 = 25.39$, $p < 0.001$ (see Figure 2).
Figure 2: Human- or blame-focused recommendations versus system recommendations
Table 2: Distribution of Accident Classifications

<table>
<thead>
<tr>
<th>Classification</th>
<th>Report Variant 1</th>
<th>Report Variant 2</th>
<th>Report Variant 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-punitive action focused on the people involved (e.g. training, reinforcement of correct behaviour)</td>
<td>8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Punish the people involved</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Counterfactual statement – Human Focus</td>
<td>15</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Counterfactual statement – System Focus</td>
<td>1</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Changes to documents</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>One-off actions such as communicating about the incident, or reviewing the risk register considering the accident</td>
<td>6</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Changes to the physical workplace</td>
<td>7</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Reinforcement or change to practices not directly involved in the accident (e.g. toolbox talks, site coordination, competency management)</td>
<td>32</td>
<td>28</td>
<td>50</td>
</tr>
<tr>
<td>Reinforcement or change to the work practices specifically involved in the accident (e.g. protecting against dropped tools)</td>
<td>25</td>
<td>26</td>
<td>15</td>
</tr>
</tbody>
</table>

As seen in Table 2, readers of Report Variant 1 were the only participants from all three reports who recommended punishment for the individuals involved (4 actions, 4.04%).
Appendix B contains examples of the recommended actions in each classification.

3.6 Discussion

3.6.1 Interpretation of results

The results show that participants presented with Report Variant 1 were more likely to recommend actions which are directed at frontline operators than participants presented with Report Variants 2 and 3. Only readers of Report Variant 1 chose punishment as an action. Though the number of such cases is small (four), it is significant that the readers of Report Variants 2 and 3 did not choose this type of action.

In terms of reaching a conclusion from our results, there are three possibilities:

1. The results are random and do not mean anything.

2. Different information within each report influenced the participants.

3. Different styles used to present the story influenced the actions decided on.

The reports were issued to a wide range of individuals who operate within specific disciplines in the construction organisation. Each participant will have had some form of exposure to a workplace accident prior to participation in this study, as all the disciplines were chosen based on their exposure to and influence on the accident process within the organisation. The results, rather than having been influenced by the style or language of the reports, may have instead been dependent on the reader’s personal opinion of accident causation and the type of action required following any event. The reader may have used their previous knowledge and experience to assess the information provided and chosen their actions accordingly. The actions which were human-focused and punishment based may have been chosen by the participants who believed their selected actions would help the organisation and the human
involved. It may have been that many of the participants who believe a focus on the human is beneficial by chance received Report Variant 1 rather than Report Variant 2 or 3.

When carrying out this type of research, it is worth noting that a participant’s past experiences and their personal beliefs will have some form of influence on their decisions and actions. For example, a reader may see similarities between the accident report information and a previous accident they were involved in and decide on similar actions because they believe these actions were successful previously. The participant’s beliefs may also play a role. A person’s beliefs are shaped by society, religion and previous experience. It is a strongly held belief among many that a mistake which caused or could have caused serious harm requires retributive action to ensure the human involved pays what they owe.

While past experience and personal beliefs may indeed affect decision making, this is insufficient to explain the results. Of the three reports, only Report Variant 1 is human error focused. This report was also the only report to elicit recommendations for the use of punishment. Though the number of such recommendations was small, this is still statistically significant. Were the results truly random and based only on past experience and personal beliefs, there would be a high likelihood that the human-focused actions would be more evenly distributed or higher in Report Variants 2 or 3 as opposed to Report Variant 1.

Report Variants 2 and 3 both provide background information that does not appear in Report Variant 1. The provision of these additional opinions and facts may have helped sway the reader’s focus from the individuals involved towards system fragilities. Conversely, had this information been provided within Report Variant 1, the number of actions focused on the frontline operatives may have dramatically decreased, as the reader would have been given a more comprehensive picture of the accident and the reasons why people did what they did.
A key reason for additional background information in Report Variants 2 and 3 is that the accident report style chosen dictates the content of the report. The style of Report Variant 1 is heavily reliant on the accident facilitator’s perception and interpretation of ‘important’ facts. Given that as humans we are naturally susceptible to hindsight and confirmation bias when analysing past events, the style of Report Variant 1 makes it more vulnerable to omitting information than Report Variants 2 or 3, as any conflicting information creates a choice for the facilitator to ensure a linear story is achieved. As the key goal of Report Variant 1 is to put forward the proven facts as the facilitator sees them, the background information captured within Report Variants 2 and 3 is often written off as opinion and hearsay. Reports based on provable facts can help an organisation understand what happened, but they are far less effective in helping us understand why. Human error is easy to ‘prove’ in hindsight and with the help of post-accident procedure reviews, whereas problems within a system can be much more difficult to label as ‘broken’ because system issues often exist among a variety of systems which are individually working as designed. It is only their interactions with other systems that create the unmanaged risk.

The accident is presented in these three variants in three very different ways. Report Variant 1 prioritises facts and minimises any background information deemed irrelevant by the author. Report Variant 2 delves into different facets of the system and the elements that are successful against those that are creating unmanaged risk. Report Variant 3 seeks to allow the various actors involved in the accident to be heard to ensure the reader has a full understanding of what happened, and the constraints faced by each of the actors.

The report style chosen influences the focus of attention. Report Variant 1, due to its focus on what went wrong, places a strong focus on the frontline operatives, which may have led some of the readers to decide that the accident was the result of careless workers. With Report Variant 2, the focus migrates from the human to the system. The description of the issues is
more focused on the ‘what’ than the ‘who’. This in turn may have led the reader to provide actions based around what needs rectification, rather than who. Like Report Variant 2, Report Variant 3 ensures that the human is not the focus of attention. Each actor’s story, and the constraints they faced leading up to the accident, is heard in full, to ensure these people are understood and the reader gains a deep understanding of the world in which these people were operating at the time of the event.

Though these reports are related to the same accident, each of them has slightly different objectives. Report Variant 1 uses a reductionist approach to find the ‘broken’ parts which caused the accident in order to fix them. Each fact is assessed against the safety management system to determine whether it is ‘broken’ or not. This creates a binary view of the accident and the actions of those involved. This in turn can lead to a ‘guilty’ or ‘not guilty’ description of the actions of those involved. Report Variant 2 focuses solely on the system and the various relationships and issues which exist within it. A human mistake is viewed as something which has been caused by a bigger issue within the system. In a similar manner to Report Variant 1, this report can transform what began as an accident which was highly personal to everyone involved into an objective, lifeless narrative which fails to capture the mindset of the accident’s actors. Report Variant 3 is focused on allowing the actors to be heard so that any damage suffered by them can be healed through the disclosure of their story. The frontline operatives are viewed as victims who require support. These differences in objectives can have a substantial impact on the type of actions determined by the reader. One of the consequences of the different styles of reporting is both the author and the reader are drawn to different information. Report Variant 1 is overly reliant on the author viewing information as important for it to be included within the final report, whereas Report Variant 3 is much less reliant on the author’s own views and is accepting of contradictory facts without resolving them to a single conclusion. This highlights how careful organisations need
to be when selecting their accident report style and whether the style aligns with their objectives. The results of our study suggest that information viewed as unimportant or not relevant by the report’s author, can have serious implications for those involved in accidents and the ability of the organisation to learn from its mistakes.

A limitation of this study is the fact that it was conducted in abstract, as the participants were engaged in an experiment rather than a real accident review. This creates the potential for participants to respond differently from how they would respond to an accident report within their workplace because of the removal of any socio-political aspects which may exist in their organisation.

3.6.2 Implications for practice

The findings in this study suggest that the accident report style and model selected by an organisation or the accident analysis facilitator to analyse the accident can have a significant impact on the outcomes of the accident analysis. This has important implications for any organisation seeking to achieve a just culture. The accident process is a core element in establishing and maintaining a learning culture within an organisation. The learnings from accidents, particularly those of high consequence, often influence an organisation’s future safety strategy. The treatment of those involved in accidents can create or destroy the foundation of trust needed to support a positive reporting culture and the sharing of critical information within an organisation. Facilitators of accident analyses must accept that the accident report style chosen has serious implications for those involved and the future ability of the organisation to learn. Our results suggest that the pursuit of a linear report based only on facts determined as important by the author may increase the potential for recommended actions to be blame-focused and impede the organisation from dealing with more serious issues which have been deemed irrelevant by the author. The omission of background
information provided by the actors involved in the event from the final report can have severe repercussions for these actors and for future reporting within the organisation.

This study raises legitimate concerns that researchers need to do more work in the area of accident analysis to provide better advice to safety practitioners in future. As with accident reports themselves, readers should take care in under- or over-interpreting the results from this study. The results are strongly suggestive that accident report style influences accident analysis outcomes, but alternative interpretations can be drawn from the results. Further work is needed to establish conclusive relationships between the facts, methods, styles and outcomes of accident reporting.
Chapter 4: RETRIBUTIVE JUSTICE AND INCIDENT INVESTIGATION

Statement of contribution of co-authored paper

This chapter includes a co-authored published paper. The owner of the copyright, Elsevier, grants permission for all authors to include their own article within their thesis or dissertation.

The bibliographic status of the co-authored paper, including all authors, is:


This chapter has been lightly edited for spelling and grammar to ensure consistency with the rest of the thesis.

The primary author of this paper was Heraghty. Both Rae and Dekker served in the role of supervisors and were active in the conceptualisation, methodology and review stages.
4.1 Rationale for the study

When reflecting upon the literature available in the area of just culture, it became apparent that though many spoke of a just culture, very little research had been conducted to understand what impact these different types of just culture had on the organisation and its workforce. It appeared that both the retributive justice and the restorative arguments contained assumptions which had not been fully tested. Before making any adjustments to the accident process, it was crucial that we gain an understanding of the original process, which contained the potential for retributive justice mechanisms to be used should management believe it necessary.

While previous studies have sought to understand the effect retributive justice mechanisms have on learning, none have provided an understanding of the lived experience of the accident process for those involved and the by-products that emerged which affected both the human and the system. Individuals’ willingness to participate in any system or process is heavily influenced by their perceptions of its fairness, as discussed in all research related to organisational justice. Gaining the perspectives of those who have both participated in and overseen the accident process would allow me to understand their experiences and how these impacted the individuals involved and their organisation.

The question set for the semi-structured interviews was designed to allow the participant to share their story without being impeded by any bias held by the researcher. The semi-structured interview used was identical to that which was used for the research discussed in Chapter 5 following the accident process modification. This was intentional, as it was necessary to use the data gained in this research as the control so that there could be an honest comparison with the data gained post-accident process modification to allow me to understand whether the changes made any difference.
The term ‘incident investigation’ is used intentionally in the title as this paper not only explores the retributive justice aspect of the process, but other elements such as language and storytelling. The title of the process under analysis was "The Incident Investigation Procedure" and it was important to clearly identify that Chapters 4 and 5 were analysing two different processes with differences not only in their approach to justice but also in how these processes are described.

A historical ethnographic approach was used for this study as, prior to modifying the accident process, it was essential that I get a good understanding of the perceptions of the original process in order to gauge the impact of the modification. Interviews were carried with those involved in accidents which were analysed using the original accident process. These interviews often started off as tense as many of participants had suffered as a result of their accident and were fearful of the interview process. Archival evidence was used in the form of accident reports to help determine the participants. This aspect of the process was challenging as, due to my own role within the organisation, it was difficult to avoid critiquing the report and allowing bias to creep into my own interview approach. To avoid this occurring, prior to each interview, I read the study’s information sheet verbatim to the participant both for their benefit and to remind me of my role as the researcher.

This paper sets out to help answer the following sub-questions:
Sub question 1.1.1 - What is the relationship between the degree of retribution and the willingness to share safety-critical information?

Sub question 1.1.2 - What impact, if any, does language have on decision making following an accident?

Sub question 1.1.4 - How do opinions about the achievement of justice and the approach used vary between different levels of the organisation?

Sub question 1.1.5 - Is there a distinct difference in the opinions on the justice system between those who have been directly exposed to the system to those who have not?
Managing accidents using retributive justice mechanisms: When the just culture policy gets done to you

4.2 Abstract

How people are treated following their involvement in a workplace accident can have far reaching implications for both the individual and the organisation. In this paper, we examine the impact the use of retributive justice mechanisms within the accident analysis process have on both the individual and the organisation. We analyse the perceptions of those involved in five accidents where retributive justice mechanisms were used. Our study of these cases shows retributive justice mechanisms used as part of the accident analysis process negatively impacts three key areas: 1) the mental health of the individual, 2) organisational learning, and 3) organisational performance. Our study also illustrates that the language used as part of the accident analysis has a significant impact on the perception of the process and the willingness to participate.

4.3 Introduction

The term ‘just culture’ is commonly used by organisations across industry to describe the process deployed (or intended) to achieve a fair conclusion for those involved in an accident or a near miss. As the name suggests, a just culture process is intended to promote a fair conclusion for those involved and a positive organisational culture, but there is considerable controversy over whether many just culture processes achieve either of these goals (Cromie & Bott, 2016; Dekker & Breakey, 2016).

The concept of just culture as both a process and as an intended outcome has received considerable treatment within the safety science literature. While criticisms of retributive justice mechanisms as an outcome of the accident analysis process are long standing (e.g., Leape, 1994), the term gained popularity primarily through the work of Reason (1997) and
Marx (2001). The primary theme introduced by Reason and Marx was a balance of blame, which may promote a lack of learning (Dekker, 2012; Kluge, 2009; Leape, 1994; Marx, 2001; Shilling & Reason, 1997; Vince & Saleem, 2004; Wu, 2000), and no-blame, which may promote a lack of accountability (Wachter & Pronovost, 2009). Where the goal was to assign blame, the accident analysis facilitator often stopped once blame was assigned and never uncovered the real issues which caused the accident to occur (Leveson, 2004). However, a total lack of assignment of blame was not considered desirable either, as it was deemed that society rightly required disciplinary action in some circumstances to achieve accountability (Marx, 2001). The just culture approach promoted by Reason and Marx balances the two extremes by accepting that even the most competent professionals are fallible and are susceptible to mistakes but is not tolerant of what is deemed reckless behaviour (Dekker & Breakey, 2016).

The ongoing debate around just culture has three main strands, framed mainly as critiques of the original concept, with responses from the supporters of just culture. First, there is the theoretical criticism that just culture inherently requires reductionist models of human error. Though well intended, these models fail to understand the complexities of the workplace and do little to increase workplace safety (McCall & Pruchnicki, 2017). By reducing an accident to the actions taken by an individual and reviewing them in hindsight and in isolation, it could be argued that the human has become the focus of attention at the expense of the larger system issues which influenced the human (Dekker, 2014). There is also the common issue that models may be used in a different manner from how their creators intended. Indeed, when models become popular, they are often used for purposes which escape the designer’s initial intentions (Le Coze, 2013). The models may become tools to justify the use of retributive justice rather than to determine if it is needed at all.
Second, there has been a shift in theoretical discourse around the purpose of accident analysis. Whereas previously these accident analyses saw blame as a problem because it inhibits learning, there has been increasing recognition that blame is a problem in its own right. The works of both Wu (2000) and Dekker (2012) illustrate the psychological damage suffered by individuals following an accident where blame was a factor in their treatment. There is a growing belief that a just culture is one that treats individuals with compassion after they have suffered an accident rather than one that simply determines their culpability (McCall & Pruchnicki, 2017).

Third, there has been a practical critique of the way just culture has been translated from safety science theory to safety management practice. This critique suggests that just culture, as it is implemented, is inherently a retributive justice mechanism. One of the reasons why retributive mechanisms are thought to be effective is the continued misuse of early 20th century research by safety professionals and organisations. The works of Heinrich (1931) on human error and Skinner (1974) on positive and negative reinforcement are often used today to justify the focus on human error and the treatment of those who suffer error. These authors, if alive today, might not agree with the interpretation of their work. Heinrich’s work, though highlighting that 88% of accidents occur due to human error, at no point suggests that people should be punished for mistakes. Skinner believed negative reinforcement to be a method of increasing a behaviour by removing something from a specific situation, not by introducing punishment to the situation. Through the misuse of Heinrich’s and Skinner’s research, the belief has been created that those who suffer accidents may pose a threat to the safety of the wider organisation and punishment will help create desirable outcomes for the organisation. Within any community or organisation, the idea of a common-wide threat leads the overall population to attempt to eliminate the perceived source (Douglas, 1992). It is only logical that if human error has been constructed as a threat to the safety of workplace populations that
organisations would choose to attempt to eradicate this threat for the greater good of their workforce.

More recently, there has been significant criticism of the use of retributive justice mechanisms to deal with those who have suffered an accident or made a mistake in the workplace. Researchers such as Leape (1994), Wu (2000) and Dekker (2012) all say that the use of retributive justice mechanisms hinders the ability of an organisation to learn from mistakes. The use of retributive methods to manage mistakes or errors has been thought to be not only harmful to the worker (Wu, 2000) but also to an organisation’s learning ability (Ruitenberg, 2002). Workforces are less likely to report mistakes for fear of retribution (Chapman, 2009; Merry & Smith, 2001), creating an organisational culture where a CEO only learns of the problems within their organisation after a person is seriously injured.

The language used within the accident process can also play a part in how ‘just’ the culture is. Stories of events which use more agent-based language can trigger more human-focused actions and requests for punishment than those in which non-agentive verbs form the majority of the story (Fausey and Boroditsky, 2010; Heraghty, Dekker, & Rae, 2018; Thibodeau and Boroditsky, 2011). The use of binary language within the report is also believed to result in a culture of judgment and blame (Woods et al., 2010), as it disregards the greyness of our world and only sees right or wrong and black or white.

Despite the volume of theoretical literature on just culture, there has been very little examination of the lived experience of workplace justice—how it is achieved, the experiences of those whom have been subject to it, and the results it achieves. For example, the respective works of Bayazidi et al. (2012) and Probst and Estrada (2010) effectively display through empirical information the impact retributive justice and blame have on a reporting culture. However, neither paper captures the emotional impact retributive justice
has on the actors involved nor the reasons why retributive justice is used. In this paper, we present a series of accident cases and the perceptions of those involved. The accident cases occurred on a construction project in the energy sector. Each accident case involves a workplace accident or near miss where retributive justice mechanisms were used. In Section 4.4, we describe the procedures used by the organisation as part of the accident analysis process and the method for selecting and analysing the cases. Section 4.5 explores the effects retributive justice mechanisms have on the individual and the organisation. Section 4.6 analyses the data found in Section 4.5 and determines the implications these findings have for industry.

The question to be answered by this study is: What impact does the use of retributive justice mechanisms as part of the accident analysis process have on the individual perceptions and the organisation because of these perceptions?

Supporting this line of inquiry, the sub-questions are:

1.1.1 What is the relationship between the degree of retribution and the willingness to share safety-critical information?

1.1.2 What impact, if any, does language have on decision making following an accident?

1.1.4 How do opinions about the achievement of justice and the approach used vary between different levels of the organisation?

1.1.5 Is there a distinct difference in the opinions on the justice system between those who have been directly exposed to the system to those who have not?
4.4 Methods

4.4.1 Participants

All five cases used for this paper were selected from a pool of accidents which occurred in a single organisation in the United Kingdom within twelve months of the study. The timeframe was selected to ensure that the experiences of those involved were reasonably easy to recollect. The research team only used cases which were more than one month old to minimise the potential psychological impact the study may have had on the individuals involved.

Cases were screened according to the following criteria:

1. Both the accident and report must have occurred within the designated period.
2. A retributive justice mechanism must have been used as part of the process or as an outcome. The following were deemed to be retributive justice mechanisms as they fulfilled the criteria of a form of punishment that was issued because a wrong was deemed to have occurred:
   - Work suspension during the process
   - Disciplinary action as a correction measure
   - Downgrading of work role.

Of the sixteen accident reports reviewed, only five met the required criteria and were accepted for the study.

For each report, a semi-structured interview was carried out with the following personnel:

- the worker who was carrying out an activity when they suffered an accident,
- the worker’s supervisor,
- the safety professional who completed the accident report, and
• the senior manager who approved the report and its related actions.

Sixteen Discovery Sessions (semi-structured interviews) were conducted within the organisation.

**Table 3: Discovery Session Participants**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Number of discovery sessions (semi-structured interviews)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The worker who was carrying out an activity when they suffered an accident</td>
<td>5</td>
<td>None</td>
</tr>
<tr>
<td>The worker’s supervisor</td>
<td>4</td>
<td>Supervisors were interviewed for four of the accident cases. The fifth was no longer working for the company and unavailable for interview.</td>
</tr>
<tr>
<td>The safety professional who completed the accident report</td>
<td>3</td>
<td>A safety professional who facilitated one of the accident reports is no longer working for the company.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>One of the safety professionals facilitated two of the reports.</td>
</tr>
<tr>
<td>The senior manager who approved the report and its related actions</td>
<td>4</td>
<td>One of the senior managers was involved in two of the reports.</td>
</tr>
</tbody>
</table>

**4.4.2 Organisation processes**

To ensure accidents were consistently managed and a just culture was achieved, the following processes were in place:
4.4.2.1 Incident reporting and investigation procedure

For all accidents on site, the following procedure was followed:

- All accidents must be reported to supervision immediately.
  - Supervision must then notify Senior Management.

- The Project Leader will ensure the full reporting and subsequent investigation of accidents on their premises.

- Authorised Investigators (personnel trained in incident investigation) may delegate specific tasks to others, including specialists, but must exercise overall management control of the accident investigation to reach a meaningful conclusion and make realistic recommendations. They must ensure that:
  - Reports are complete, accurate, vetted for legally embarrassing phrasing.
  - Appendices contain appropriate sketches and photographs.
  - Witness statements / supporting documents are appended and referenced.
  - Conclusions and recommendations are agreed and clearly presented.
  - The report and recommendations are closed out and the report circulated.

- All relevant information must be collated to allow retrieval in the event of a claim. Information will also aid statistical analysis of accident trends.

The incident report required the following sections to be completed:

- Introduction
  - Scope of investigation
  - Summary of injury & disruption
  - Key persons listing
• Project background
• Incident details and timeline of events
• Immediate post incident actions
• Further project actions taken (where applicable)
• Immediate causes of the incident—primary & secondary
• Human factors and root causes
• Photographs, diagrams and sketches
• Investigation findings
• Recommendations of investigating team.

All incident investigators had received incident investigation training prior to carrying out reports.

**4.4.2.2 Disciplinary hearing**

This procedure is used by the organisation to deal with misconduct. Examples of misconduct are a breach of a policy or procedure or negligence in the performance of duties.

The procedure has three steps:

**Step 1:** Following any investigation, if the organisation considers that there are grounds for disciplinary action, the individual will be required to attend a disciplinary hearing.

**Step 2:** At the disciplinary hearing, the organisation will go through the allegations against the individual and the evidence that has been gathered. The individual will be given an opportunity to state their case and present any evidence of their own. The organisation will inform the individual in writing of their decision and their reasons for it, usually within one week of the disciplinary hearing.
Step 3: If the individual feels that disciplinary action taken against them is wrong or unjust, they should appeal in writing, setting out their full grounds of appeal, within five working days of the date on which they received the written decision.

Suspension: In some circumstances, the organisation may need to suspend the individual from work. The suspension will be for no longer than is necessary to investigate any allegations of misconduct against the individual or so long as is otherwise reasonable while any disciplinary procedure against the individual is outstanding. The organisation will confirm the arrangements to the individual in writing. While suspended, the individual should not visit the premises or contact any of the organisation’s clients, customers, suppliers, contractors or staff, unless they have been authorised to do so by their immediate line manager.

- The personnel who facilitated this process were trained to do so.
- Though the process was not communicated in its entirety to employees, the project induction did convey that non-compliance with safety rules could result in disciplinary action.

4.4.3 Accident cases

There were five accident cases chosen for analysis. The summaries provided below are extracted from the company accident record system. Details relating to names, places and dates have been removed to ensure anonymity.

4.4.3.1 Accident Case 1

Two workers raised a concern to their supervisor regarding the work carried out by a fitter. The concern was regarding the fitter carrying out maintenance on the conveyor belt without the batching plant being fully isolated.
On the morning of the event, the fitter attended a daily meeting at 07:30. It is during this morning meeting that the maintenance team and the batching plant management would review the maintenance programme for the day and agree batching plant down time to allow the programme’s implementation. There were no maintenance activities planned for that day that required the batching plant’s activity to be stopped.

The fitter, specialised in mechanical maintenance, began carrying out the daily plant checks of Batching Plant 1, aided by the department’s daily check sheet. They were accompanied by a person specialised in electrical maintenance. During their checks, the fitter noticed that the alignment of the mixer conveyor belt was misaligned to the left. The fitter decided to rectify the situation there and then. The belt was not running, so the fitter radioed the batching plant operator asking them not to restart the belt for the next five minutes while they were carrying out some maintenance.

The fitter made their way to the key safe in the batching plant office to take the key to unlock the double doors giving them access to the conveyor belt. On unlocking the double doors, the fitter took hold of a piece of steel rebar and used this to push the belt a couple of millimetres back into position. They also noticed that the return belt roller carried some lumps of muck, which they dislodged using the same technique.

The human factor findings were:

- Fitter not stopped in their actions by either co-worker or batching plant operator
- Fitter not partnered with long serving and assertive buddy
- Fitter not following expected process
- Fitter’s perception of duties misaligned with the safety culture
- Inadequate controls regarding access to moving machinery
• Procedure confusing or incomplete: no references to isolation requirements; needs clarifications on decision process when faced with unexpected/unplanned situation

• Access controls: fitter could access machinery without invoking full isolation (no control and easy access to the plant access door’s keys); batching plant operator did not see anything wrong with the fitter’s request

• Questioning attitude: perception from buddy that it is not his place to question actions of a more experienced member of staff

• Human–Machine interface: permit system inadequate in allowing maintenance work to be performed while isolation not in effect

• Supervision: fitter allowed to carry out work despite previous incident, without further controls in place.

The worker involved was stood down from their role for six weeks while the accident analysis process was underway. Following a disciplinary hearing, the worker was subject to disciplinary action for not isolating the conveyor belt prior to maintenance works and was moved to a different role.

4.4.3.2 Accident Case 2

At about 13:00 hours, one of five false worktables were being dismantled. Three such tables had already been dismantled in line with the approved procedure and in line with the line manager’s instructions given at a supervisor’s meeting the previous day.

The next table was of larger dimensions, taller, and contained additional supporting members. The immediate task supervisor independently and without consultation chose to use a forklift truck in the operation. During the operation, the table became unsteady and started to move
off the forks but was stopped by an adjoining table. It did not fall to the ground and no person was in immediate danger.

The required safe system of work for this operation features in Revision D of the Risk Assessment and Method Statement (RAMS).

This operation was known to the dismantling team who had been previously briefed on the procedure and signed a briefing form to confirm understanding and compliance.

At about 17:00 hours the previous evening, the dismantling operation was discussed at the supervisors’ meeting. The methodology was discussed, as was the use of a scissor lift to access the top section to allow it to be manually disconnected and lowered to the ground in the scissor lift. There was no requirement to use any plant in the dismantling operation.

The human factors findings were:

- Violation intentional by group by not following approved procedure. Work Party did not follow the approved procedure.
- Lack of attention and improper decision making, taking a short cut. Work Party did not follow the approved procedure.
- Inadequate competence—supervisor chose to knowingly work outside of an approved procedure.
- Inadequate control of work—supervisor chose to knowingly work outside of an approved procedure.
- Inadequate communication—supervisor did not consult with the line manager to discuss the proposed change in the operation. Forklift driver did not challenge their requested involvement in the operation.
• Failure to learn from events—previous lifting incidents, safety stand downs and briefings had been ignored.

The forklift operator’s supervisor was stood down from their role for five weeks while the accident analysis process was underway. Following a disciplinary hearing, the supervisor was subject to disciplinary action for instructing the operator to lift the load, contrary to procedure requirements.

4.4.3.3 Accident Case 3

At about 13:50, an emergency call was made through the site radio communications using the orange button notification system. The call and subsequent conversation reported the collapse of an employee on the platform and requested emergency medical support be dispatched to support platform resources.

The report was made by an Incident Controller (IC) who remained at the scene. The injured person stated that they had been hit on the head by the hatch of a diesel bowser during a refuelling process. The IC reported that there were no visible signs of injury to the head or face with no blood apparent on the person or the person’s clothing. After field examination by site medical services, the Injured Person (IP) was conveyed via external NHS ambulance to hospital for further examination.

At about 13:00 of the day in question, the employee was engaged in refuelling duties with the driver of a fuel tanker on another platform. This is a routine activity performed daily on site. The IP has stated that, while preparing for the refuelling process, the hinged hatch fell onto their head. The other driver did not witness this incident as they were in the cab preparing the printer to record the discharge of fuel.

On completion of their duties, the IP returned to their platform and entered the office area. They complained of being hit on the head by the diesel hatch and of feeling unwell. They
went outside for fresh air (contrary to reports that they were found in a collapsed state) and sat down of their own free will on the concrete floor.

An IC trained employee was informed, and the emergency response initiated. Members of the site medical team attended the IP who was subsequently transferred to hospital by external NHS Ambulance for further examination. It is understood that an air ambulance was mobilised to support the emergency response effort but was turned around before landing.

The human factors findings were:

- Lack of attention and improper decision making, taking a short cut. Security carabiner not engaged in the lock point. A repeat observation not communicated to line supervision.

- Inadequate training. The IP did not receive the correct level of training in the fuelling process to include fire response and environmental training.

- Inadequate control of work. No Point of Work Risk Assessment (POWRA) completed including the Stop, Think, Act, Review (STAR) process. No finalised Risk Assessment Method Statement (RAMS) in place for the process.

- Failure to report events. Incident not reported to supervisor. The repeat findings that bowsers are routinely left insecure by failure to engage the carabiner was not reported to line supervision.

The operator was stood down from their role for 13 weeks while the accident analysis process was underway. On completion of the accident analysis process, the operator returned to their role. Subsequent to the accident analysis process, the operator was subject to disciplinary action for an unrelated matter. It was the belief of the operator that they received this punishment for their role in the accident.
4.4.3.4 Accident Case 4

While lowering a rebar cage into a work area, the crane driver tracked the crane in a forward motion without instruction or guidance from the slinger/signaller. The crane caused damage to two PERI shutters stacked on the ground in front of the crane.

A frequently repeated operation to lower rebar cages into the work area was being undertaken. The area was being used as a shuttering build compound with a crane track running east to west, parallel to the platform.

An interview with the crane operator was conducted and in the opinion of the interviewer the individual appeared to be tired or fatigued. A drug and alcohol test for cause was carried out by Hinkley Health and found to be clear (negative).

The incident was caused by the operator acting outside of the standard operating procedure, by tracking the crane without the instruction and guidance of their dedicated slinger/signaller.

The human factors findings were:

- Individual acting outside of lifting protocols and improper decision making.
- Individual made an incorrect assumption regarding clearance for tracking and made a personal decision to prevent the Safe Working Load (SWL) alarm from activating, without communicating with the slinger/signaller first.

The issue was not discussed at the time between the slinger and the crane operator. Approximately three hours later, the slinger reported the action to their supervisor who determined it as a near miss and initiated the accident analysis process. The crane operator was stood down from their role for five weeks while the accident analysis process was underway. Following a disciplinary hearing, the operator was moved to a different role, as the management team deemed the operator no longer fit to operate a crane.
4.4.3.5 Accident Case 5

A scaffolding operative was observed from a distance of approximately 60m, standing on the intermediate guard rail of a Tele-Tower podium platform. Another operative was assisting the task while standing on the ground. The incident was witnessed by at least four Health & Safety Managers/Leads.

The Health & Safety Lead immediately approached the individuals and challenged their actions, including asking if they knew why they were being stopped from progressing their task. Anecdotal evidence suggests that the individuals were aware of the reason for the challenge and the stopping of work. The response from the individuals suggested that they knew the access tower could extend but did not know how to do so.

The individuals were then instructed to return to their welfare unit and contact their supervisor to report their actions. (There is no evidence that this instruction was carried out). Approximately one hour later, the H&S advisor for the area was instructed to go to the location and stand the scaffolders down, contact their supervisor and conduct a briefing. This was done and an investigation was commenced to determine the reason for the event.

The two individuals identified at the incident were interviewed but declined to acknowledge that they had carried out the task in an unsafe manner and not in accordance with the safe use of the podium system and/or manufacturer instructions. The individuals were stood down pending the results of this investigation and review for a disciplinary decision.

This incident is deemed to be one of individuals taking an unnecessary short cut to reach a high-level strut and putting themselves at risk of serious injury in a fall from height. The chosen equipment was suitable for part of the task but not suitable for the whole task. A suitable mobile alloy tower was available for use but not used. The morning
instruction/briefing advised the individuals where the alloy tower was located, and that they were to use it for the task to be undertaken.

The human factors findings were:

- Individuals taking unnecessary personal risks.
- Hold point inspections of the roof section for completeness was missed or not carried out, therefore retrofitting of components required work at height access equipment, once the structure was at full height.
- Poor use of the shelter erection checks and hold points led to the need for retrofitting braces while at the fully erected height.
- Incorrect personal choice of appropriate access equipment, which was available to complete the installation of the missed braces.

Following a disciplinary hearing, the workers and their colleague were subject to disciplinary action. The worker was punished for what was deemed an unsafe act and a breach of a health and safety rule, while their colleague was punished for not stopping an unsafe act from taking place. In this case, the worker disputed the accuracy of the report as they believed the action they were accused of, which was standing on the handrail of the platform, never occurred. The worker believed the members of the safety tour misconstrued what they saw due to the distance between them and the activity (approximately 50 metres).

4.4.4 Procedure

To gather the qualitative data necessary, the first author, who was also an employee of the organisation, conducted semi-structured interviews with those listed in Table 3. The first author did not participate in any of the accident analyses used as cases for this study and had no direct or functional reporting lines through any of the participants. The semi-structured interview questions created for this study were designed to gain an understanding of the
safety justice system through the views of those exposed to it. Each participant provided their perception of the accident analysis process and the actions that emerged from the accident analysis in which they were involved. The interviews also discussed the impact the process has on the learning culture within the organisation. All interviews took place between May and August 2018 and were scribed by the first author. All interviews were captured in written format due to participants being unwilling to be recorded.

The interview focus points were:

- any previous experience with safety injustice
- the impact the current safety justice system has on learning
- views on the organisation’s reporting culture, and
- the participant’s own experience of the accident analysis process and how justice and learning is achieved.

4.4.5 Coding

There is no objective way to examine an organisational justice process. Every version of events, including the official reports and the researcher’s account, is a post-hoc interpretation of what happened. With this in mind, the research team believed that the most suitable way to gain a better understanding of the organisational justice process was to analyse the experiences and perceptions of those who oversaw the process and those who lived it.

Following an initial review of the participants’ transcripts, 14 concepts emerged using initial (open) coding. When coding, both similarities and inconsistencies were highlighted to help draw conclusions about the process. The descriptions and organisation of these concepts were openly discussed among the authors before finalisation.
From the 14 concepts, two categories emerged into which the concepts were divided. The coding process was based on grounded theory from Corbin and Strauss (1990). All opinions provided by those involved were treated equally, regardless of their role, and all opinions were assumed to be the true experiences of the participants. The researchers are confident that saturation has been achieved in this study, as the concepts which emerged were consistent across the accident cases while no significant new information emerged to indicate the need for further exploration.

4.5 Results

4.5.1 Impacts of the accident analysis process

4.5.1.1 Rumours and innuendo can flourish when there is a lack of good communication

When the initial facts of the event are not swiftly determined and communicated, rumours can be created to fill the information gaps. This can have a negative impact on both the process and potential learning. The rumours that are generated can lead to an over-the-top (OTT) response to managing the event by those in charge of the site: “Someone gave exaggerated information to the client, which led to an OTT response” (S).

The rumours created at the start of the process can cause problems for those attempting to understand and analyse the accident. The rumours can swiftly become the ‘facts’ on which the report and decisions will be built. In one case, there was great difficulty determining what had happened, as by the time the senior manager overseeing the works was informed of the event, there were multiple stories being provided as to what had occurred. “The initial reporting was embarrassing because of all the phone calls and everyone’s opinion” (SM).

Rumours can also shape the conduct of the accident analysis. The genuine facts can become clouded by the stories created to fulfil people’s need for swift information. Rather than
hearing uncontaminated first-hand accounts, the analysis facilitator must sort rumour from fact. “There was a lot of hearsay and conflicting stories. This event was particularly difficult as there was a time lapse between the observation, the initial conversation and my investigation. I was given a third-hand account when I started investigating” (AF).

An accident report built on rumours and innuendo can result in those involved suffering negative consequences. The creation of sensationalist claims by various members can lead to excessive responses. As the human involved and their mistake can often be viewed as the start of the accident, the blame for the excessive response can be placed on their shoulders: “My whole episode was blown out of proportion by others and felt like I was blamed for other people’s rumours about my accident” (W).

All of this can result in a greatly reduced amount of learning for the organisation and excessive time placed on issues which have been created through rumour rather than legitimate information.

4.5.1.2 The determination of an accident can be answered by an unofficial shadow process

Not every event that could be analysed is analysed. Whether an event is analysed depends on whether it is determined to be an accident. It is this determination which triggers the official accident analysis, but the determination itself is an unofficial, murky, subjective process (a shadow process).

Within teams, the determination of an accident and the willingness to report can be affected by the team’s relationship with the actor involved. A report may be used to cause damage to the career of a peer towards whom others in the group are hostile: “I believe I was set up. The project I work on works in different ‘cliques’ and you have to be aware. With the mistake I made, it happened early in the morning and it wasn’t until lunch time that I was told to go to my supervisor” (W).
Whether an accident is deemed an accident or not can be influenced by the time pressures which exist at that moment. In more demanding periods, the acceptance of workarounds which may not be best practice can become acceptable to help achieve the primary goal, which is to deliver the works to meet the schedule: “It suits people sometimes to follow the rule book but when there is a push on, things are more flexible” (S).

Time pressures also influence the judgement of the management overseeing the works. In a time-constrained environment, operational management can be reluctant to accept accident reports due to the time it takes to carry out the analysis. This highlights the many conflicting goals faced by managers, who are held accountable for achieving aggressive programmes and safety: “From a manager’s point of view, why do I want the hassle and time consumption an accident report brings? I’m already at 130% and then there is all this? Is it worth it?” (SM).

The maintaining of a statistic can influence an organisation’s acceptance of an accident report. Organisations may dispute the validity of accident reports which have the potential to be deemed a Lost Time Injury (LTI) as they fear an increase to their LTI rate. This dispute is not made in the interest of achieving safety but to appease the various stakeholders who desire a zero statistic: “All management cared about was avoiding an LTI, as the project had just celebrated 1,000,000-man hours LTI free. The safety advisor was trying to make it like I made it up” (W).

Allowing an accident to be determined by a shadow process which suppresses the official process can erode the workforce’s confidence in the accident system and may stifle both reporting and learning. These shadow processes can also lead to organisations losing sight of the necessity of the accident reporting process and the positives it offers.
4.5.1.3 *Actors’ pre-existing opinions influence the process and the outcome*

Prior to an accident occurring in the workplace, there are already established relationships between all the actors involved. Some of these relationships are positive while others are not. These relationships can play a deciding factor in how an accident is determined, an accident report shaped, and actions determined following an event. The relationships between those involved can play a more decisive role than the facts.

Pre-existing views of the actors involved in an accident can influence an accident analysis team’s judgement of the actor’s story following an event. Personal opinions of the actor and their personality can lead to question marks being placed over the authenticity of the information provided: “*The person is quite an emotional and needy person and I did wonder whether they embellished the story for attention*” (SM).

Negative opinions can be formed around individuals who have suffered accidents, depending on the outcome. Involvement in a prior event can result in those leading the accident analysis entering the process with biased views: “*One of the first things I got asked when I reported my accident was about a previous accident I had*” (W). The individual’s version of events can be disregarded by those leading the analysis because of their involvement in a previous event and the opinion which now exists of them: “*The worker involved had already been involved in a case that led to another worker being disciplined. For me, this led to the team being sceptical of the worker’s story on hearing they were involved*” (AF).

The individual’s past performance also influences the approach and the decisions made. Safety can be viewed as an easy means of dealing with personnel who are not meeting their management’s standards: “*The accident process can be used to deal with performance, as it is the perfect excuse to deal with a guy who isn’t ticking all the boxes*” (S). The accident analysis process can be viewed as a useful vehicle for management to deal with those in their
team they view as difficult: “Somebody who causes us grief, you can guarantee that when they have one accident, their manager is rubbing their hands and saying. ‘Finally, he’s f****d up and can go’. It’s the norm in the industry” (SM). The eagerness of management to use the accident analysis process to performance manage can result in them making blatant attempts to manipulate the accident analysis to suit their needs: “Supervision were pestering me to do something about him because of his past performance” (AF).

In contrast, existing relationships can result in individuals avoiding the negative treatment suffered by their peers after an accident. Having a close relationship with someone of influence within the organisation can reduce the potential for negative treatment greatly for any individual who has suffered an accident: “People are treated differently depending on who they are and who they are connected to. The action taken depends on those involved” (S). These existing relationships can lead to an inconsistent approach to managing accidents. The approach to accidents of a similar nature can vary greatly depending on those involved: “I’ve seen worse cases than mine on this project which were swept under the carpet” (W).

The relationships between those involved in an accident can greatly reduce the potential learning from an event if allowed to influence the accident analysis. The future learning of the organisation can also suffer should this be allowed as those who are subjected to the process will have no trust in it or those who manage it.

4.5.1.4 Confirmation bias within the process and those facilitating it steers the outcome towards blaming the individual

Both the accident analysis process and the past experiences of those overseeing it can direct an accident analysis away from a learning outcome. The majority of those involved in the oversight of an accident analysis have a basic understanding of the operational work under discussion. This knowledge can lead to the creation of a story by the management involved
before any of those who suffered the accident have been given the opportunity to share what they know to have happened. Consequently, the outcome of the accident analysis can become a foregone conclusion before it has even commenced. The process itself also plays a part. Processes can be human error focused and lead to a self-fulfilling prophecy whereby human error naturally becomes the key learning at the expense of actual learning gained from the stories of those who suffered or witnessed the accident.

The accident analysis team can enter the process with pre-conceived ideas regarding the event and how it took place. The questions chosen for those involved can turn into leading questions to support the accident team’s theory—a clear form of confirmation bias: “The safety advisor was trying to make out like I made it up. They were interrogating me” (W). These leading questions can eventuate in the worker capitulating instead of providing their true story. “We continued the re-enactment until we got them to admit fault. I don’t know if they were agreeing or whether they were throwing in the towel because they had had enough” (SM). Where the story of the worker does not align with the conclusions of the analysis team, the worker can be branded a liar to help confirm the accident team’s assumptions. “Management said I was refusing to admit my mistake, but they were claiming I did something which I didn’t do. They made me out to be a liar which I’m not” (W). Those overseeing the accident can also resort to making counterfactual statements to strengthen their pre-conceived guilty verdict: “They brought an issue to me and launched into a procedure rant and that ‘he should have...’” (S).

In many organisations, the accident analysis process is directly linked to an HR disciplinary process. The linking of these processes can influence the accident analysis and its outcomes as the process becomes much more individual focused due to the very nature of a disciplinary process. This can lead to a culture where blame takes precedence because of the merging of these systems. The direction of the accident analysis has been set the moment a disciplinary
hearing has been announced: “When something goes wrong, it gets taken out of the supervision’s hands and HR take over. This means that they are already thinking about disciplinary before the facts are on the table” (SM). This approach can have a negative impact on those carrying out the accident analysis, as it can create the impression that the decision has already been made without hearing from those who suffered the accident. “When I started the investigation, management were already talking about punishment. Nobody had spoken to the guy” (AF).

Confirmation bias has the potential to negatively influence the accident analysis process and it is the worker who suffers most.

4.5.1.5 Only those who are not directly exposed to the process believe the language to be irrelevant

From the four different role types which were interviewed, three of these roles were operational: the worker/operator, the supervisor and the senior manager. The other role type interviewed was the safety professional, who served in the capacity of the accident analysis facilitator. It was only the safety professionals who believed that the language used within the accident analysis process had no bearing on people’s perception. Instead, they believed that it is the approach taken which influences the outcomes. The other three role types all stated that the language used can have a negative impact on the process and the individuals involved.

The workforce spoken to believed the use of investigation-style language triggers thoughts of dismissal and the loss of livelihood within those exposed to the process and its outcomes:

“The language brings out my worst fears. When someone says we are going to do an investigation on this, I think the worst. I fear for my job, the money I need for my kids” (W).

The language can be viewed as similar to that used by the state system when prosecuting
criminals: “It makes you feel like a criminal. People know that an investigation really means an interrogation” (W).

The view from those in senior management is that the continued use of this style of language has the potential to hamper the level of information shared by the workers after an accident due to its ability to induce fear: “I think the language really needs to change; investigations and disciplinary hearings really don’t encourage people to speak up. It sounds like we’re the police. I do believe it impacts the information the guys share” (SM).

The health and safety professionals who facilitated the accident analyses had a different view. In their view, the approach taken to analyse the accident, rather than the language used to communicate the process, had the greatest influence on the outcomes following an accident. “I don’t think the language used is an issue with accident investigation. I believe it’s all down to the approach that we use” (AF). Further, the safety professionals believed the level of reporting achieved is not influenced by the type of language used: “I don’t think language has any impact on reporting; it is all about how we deal with events” (AF).

It is clear the views of those subjected to the accident analysis process have a very different view of the language used to those who are facilitators rather than participants of the process.

4.5.1.6 The use of suspension during the process is viewed as damaging by all levels of the organisation

In each of the five accident reports chosen, the operative involved was stood down until the accident analysis had been completed. All levels of the organisation spoken to had a negative opinion of this aspect of the accident analysis process and believed it to be psychologically damaging to the individuals involved. The lengthy wait, combined with the dread of the unknown outcome, can build fear and stress not only for the worker, but also their family. “I was sat in the canteen for five weeks awaiting the outcome, which was pretty demoralising. It
felt like I was in prison. It was a case of not knowing if I had a job or not. My family were fearful as I could lose my job” (W).

Though officially the use of suspension is to minimise any risk associated with the competence of the worker while the analysis is being carried out, those spoken to view it as a form of punishment. “It’s the waiting for them which is the worst. It’s punishment in itself” (SM). While there is no guarantee that the learnings from the accident will be competency related, the suspension can have a lasting impact on the worker’s perception of their own competence and how their peers perceive their abilities. “The worker was stood down for a long period. They probably felt disempowered and stigmatized among their peers. I would say their pride was damaged because it would make you feel incompetent” (SM).

Some believe that standing the worker down without providing them with meaningful work has a negative impact on the worker’s mental wellbeing and confidence: “The problem with the process is the duration which people are stood down for. We should give them work to keep their mind active. It’s something I disagree with as it messes with the worker’s head and doesn’t do anyone any favours” (SM). The request for suspension can be issued by the client. Supervision view this part of the process as unfair and damaging to both the worker and their support group: “The client often asks us to suspend our workers until the investigation is complete, which can take weeks. This negatively impacts the worker, their family, their friends. This is the one area I don’t think is fair and doesn’t help the process” (S). The management team believe suspending the worker erodes their confidence at a time when there is a genuine need to help them regain their confidence as quickly as possible: “The operator was stood down, which I believed to be wrong, as we needed to get him back in the crane asap to help rebuild his confidence” (SM).
Senior management believe there is a need to move away from suspension as it is the workers’ fear of this aspect of the process which negatively influences reporting and learning: “We need to move away from suspending people and standing people down. I think a percentage of people fear this part of the process” (SM).

It is evident that those driving the continued use of suspension as part of the accident analysis process are not management within the operational team, but other stakeholders further removed from the work and with less of an understanding of the damage it causes to the mental state of those involved and their support networks.

4.5.1.7 People in different positions can have very different views on the fairness of the process

There is a stark contrast between the opinions of the operatives and the opinions of supervisors, senior managers and safety professionals. Workers involved in this study believed they were treated poorly, while management and safety professionals believed the workers involved were treated fairly. Disbelief shown by management towards the worker’s story leads to the anger of the worker towards management and the process: “I thought I was treated appallingly; it always felt like my story wasn’t being believed” (W). Alternatively, the creation of a story by management which the worker does not agree with generates similar animosity from the worker towards the system: “I believe my case was an injustice. I believe still I didn’t do what they said and management’s dealing with the issue was terrible” (W).

The workers can believe the accident analysis is not driven by a pursuit for safety but by politics. Fear of a damaging statistic can drive the negative treatment of those involved: “I was hounded by my managers to come back to work for the investigation, even though they knew I was still unwell. All management cared about was avoiding an LTI” (W). The use of punishment against the worker can be viewed as a means of setting an example to all other...
workers who choose to deviate from the rules in place, rather than as a method to help achieve future safety: “They just wanted to make an example. It was completely unfair” (W).

Those in management, in contrast to the workers spoken to, often believe the treatment of those involved to be fair, even when they are aware that the workers involved believe otherwise. In the eyes of management, the treatment of the worker can be deemed fair even when the worker is vocal in their disagreement: “The worker felt they were treated poorly but I didn’t see anything wrong with the worker’s treatment” (S). The punishment can be viewed as fair simply because the worker has chosen not to object to the outcome: “They had a choice when issued with punishment and they chose to accept it, which shows it was a fair process” (SM).

The views of safety professionals are often more aligned with those of management than the workforce on the topic of fairness. It is the view of some safety professionals that the treatment of the worker, whether it is suspension or discipline, is vindicated in cases where the worker declines to provide a statement, as it is determined that this is an attempt to conceal evidence: “I believe everyone was treated fairly. The worker initially declined to give a statement and then asked for union advice. Why would you not want to co-operate unless you had something to hide?” (AF). The use of punishment to deal with mistakes which led to an accident is not deemed unfair by some safety professionals: “I have never encountered safety injustice on any project. I have seen guys move on after being punished for making mistakes” (AF).

This shows the gap which exists between those who are subject to punishment following an accident and those with the authority to issue punishment or to influence it.
4.5.1.8 Those further removed from the work are more forceful about the need to follow safety rules

Those who carry out the work are much more likely to focus on the risks they are exposed to as opposed to the rules. For those in management positions, the opposite is the case, as they tend to be more likely to focus on the safety rules which require adhering to, sometimes at the expense of risk management.

There is a significant difference in opinion between the workforce and management as to the determination of an accident. From a worker’s perspective, it is only an accident when they are exposed to unmanaged risk. The worker does not always view risk management and procedure compliance as one and the same: “I followed the process as I knew it and based on previous experience. There was no risk to me in what I did” (W). In contrast to this, management can determine an accident not necessarily because of unmanaged risk sighted but because of a deviance from the written safety rules. This is something which creates animosity within the workforce towards the system: “What I was doing wasn’t unsafe. It felt like the manager was enforcing a rule rather than dealing with a risk” (W). In some cases, the gap between some safety rules and the risks they are designed to help control was not only evident to the workforce but also to some of their management, yet the process nonetheless continued. “He didn’t follow the rule book, but he wasn’t at any risk. If we go by the rule book, he did wrong. but there was not any risk” (S).

The fixation of management on rules rather than risk can create a negative outcome for the workers who are subject to the rules and the organisation’s programme targets. When an accident occurs, the actions of those involved are reviewed against the rules to help determine fault: “Rules are in place to be followed. When an investigation happens, the rules are there to hold people accountable. Rules are in place for a reason and should be respected” (S). Even if the rules are unachievable and the workers have found a safer way to carry out the
work, there can be a determination by management to enforce the rules. In some cases, this has resulted in lost time due to the resulting stoppage: “We had a situation where the guys found a better way to do things as the procedure was unachievable. When the client found out, the job was stopped for three days because the procedure wasn’t followed” (AF).

This approach to safety can generate worker hostility towards safety rules and distract management teams from the actual risks due to their fixation on the need to adhere to the prescribed rules.

4.5.1.9 Perceived pressure from external stakeholders drives the search for quick answers and scapegoats

Political pressure or perceived political pressure from external stakeholders following an accident can result in the ill-treatment of those who suffered the accident. The treatment of those involved in an accident can be directly linked to the employer’s perception of the client’s expectations. Serious accidents create significant political disruption within organisations. This political disruption generates a desire for a serious response to both deflate political pressure and allow a swift return to normal operations. As in-depth accident analysis requires a considerable amount of time to complete, the punishment of those involved in the accident can be viewed as a more favourable option. The human who requires punishing can then be viewed as the problem requiring fixing and the punishment is viewed as the serious action taken by the employer to fix the problem.

The stoppage of works by a client can create internal pressure within the organisation to find a swift solution that will allow works to recommence. This pressure can generate knee-jerk decisions and the provision of a scapegoat to help close the accident report and recommence the activity: “With this worker’s case, it felt like people were demanding answers and he was the answer. When the client demands answers, we rush and give answers because they’ve
stopped the works. The quickest answer to give is a person” (S). The pressure placed on management teams from various stakeholders following an event and the demand for immediate responses can result in a blame-focused accident analysis where the aim is to prove that the worker’s actions were the cause: “We did the re-enactment to confirm fault. People were demanding answers and quickly. I think because it was escalated to such a scale, there was a lot of pressure to have definitive answers” (SM).

The maintaining of the relationship with the client is a factor when making decisions related to accidents. Those managing the works can take hasty actions which may not be fair or reasonable because they perceive that this is what the client desires. “I think we have knee-jerk reactions when the client gets involved because we want to keep them happy” (S). The worker can receive harsh treatment at the hands of their employer because the employer believes that this will show the client that the accident, and safety in general, are being taken seriously: “I often think we overreact and treat people harsher than we should when the client is involved to show them we are taking it seriously and following a hard line” (S).

The approach and behaviour of the client team can also have a detrimental impact on those who suffer an accident. Should the client overreact to an accident and place excessive scrutiny on the organisation, the accident analysis process timeline extends. This timeline extension increases the anxiety levels of those involved because of the unknown outcome: “The client blows everything out of proportion which in turn negatively impacts the workforce. When something is dragged out, people get nervous” (S). The ill-treatment of those who suffered the accident can also be at the behest of the client. “The client often asks us to suspend our workers until the investigation is complete” (S). The actions chosen and their severity can be a result of the client’s involvement in the accident analysis process: “Had the event not been witnessed by the client, I don’t believe it would have been dealt with in the same manner. There were perceived external pressures to act on this” (AF).
punishment-focused approach by the client creates a culture of fear where learning is restricted. The workforce therefore dislikes their presence in the workplace: “The client is driving fear and influencing behaviour in a negative way. The guys distrust them as they come in and start blaming people” (AF).

This shows that the accident analysis process and the treatment of those involved is heavily influenced by the approach taken by the external stakeholders associated with the project. Much of the decision making can occur with the appeasement of stakeholders in mind rather than the achievement of future safety.

4.5.1.10 The accident analysis process serves as a vehicle for several non-health and safety agendas

The accident analysis process can be used to fulfil objectives which are not related to safety or risk management. It is sometimes difficult to performance manage an employee when a manager believes they are not fulfilling their duties. This can be due to the time and effort needed to ensure the performance management process is adhered to. The accident analysis process provides management with the opportunity to deal with the worker in a swifter manner by labelling the punishment safety-related: “I do believe that the accident process can be used to deal with performance as it is the perfect excuse to deal with a guy who isn’t ticking all the boxes” (S). Where workers are viewed as troublesome in some way, the accident analysis process provides the manager with an opportunity that the performance management system would not, as the issue may not be related to performance but to the manager–worker relationship: “Somebody who causes us grief, you can guarantee that when they have one accident, their manager is rubbing their hands and saying ‘Finally, he’s f***d up and can go’. It’s the norm in the industry” (SM). The desire to use the accident analysis process to deal with worker performance has a negative impact on the accident analysis itself and its facilitator. “I do believe that accidents are often used as a performance
management tool as in this event, supervision were pestering me to do something about him because of his past performance” (AF).

Where there is disharmony among peers within a work group, the accident analysis process is viewed as an opportunity to settle grievances. The quarrel can lead to a team reporting an event not because of its safety implications but with the aim of inflicting harm on the career of the individual they conflict with: “The event was a sham. It felt like my team were using this to get at me because we didn’t get on great. They got rid of three people since. It is a clique” (W). In cases where there is conflict, workers can be very open regarding their ill-will towards a peer: “Some of the guys I work with were asking for my punishment” (W).

Some use the accident reporting system to display themselves in a positive light to their management team for both role justification and career progression reasons. This can be done at the expense of their fellow workers and is not always for the benefit of safety on site. A worker can lose their job because a fellow worker has set their sights on their role and uses the reporting of an accident to accomplish their ambition: “One of the workers who raised the concern was a contractor who wanted to get his foot into our organisation; he is now in my old role” (W). Young employees can view the reporting process as a means of getting themselves noticed by senior management and improving their opportunity for promotion: “I actually think people on site will report any little thing now. You have all these young lads looking for promotion and are using the system for that” (W). The contractual situation of the individual can influence their approach to safety and how involved they become in safety-related situations: “A lot of people on this project are day-rate contractors and use safety to justify their existence” (S). This can lead to safety issues being dealt with in a harsher manner than would be the case if dealt with by individuals with different contractual circumstances: “Too many people are trying to justify their existence using safety and being harsh” (SM).
The action taken following an event determined as safety-related is not always chosen for safety reasons. Punishment can be issued after an accident to display to the workforce and external stakeholders that the project takes safety issues seriously: “I think it all was more politically motivated than safety motivated. They just wanted to make an example. I believe the site wanted to show they were serious about risk” (W). The worker’s actions are sometimes determined as the cause of the accident, not because this is factual but because there is a need to appease stakeholders and refocus on production: “With the worker’s case, it felt like a lot of people were demanding answers and he was the answer. The quickest answer is the person. We rush the whole thing to keep the client happy and get back to work” (S). The actions taken can be viewed as an attempt to limit reputational damage to those more senior in the organisation. The termination of a worker’s contract can be enough to convince stakeholders that the issue was sufficiently dealt with: “The guys up top are too smart to get caught. When something goes wrong, there needs to be someone to blame. Often people are sacked to cover other people’s a**s. The workforce isn’t stupid. They know when someone is a scapegoat” (S). The human-focused actions can be a distraction from bigger issues in the system which are not being dealt with: “I’d raised an issue with the system, which has to this day gone ignored, yet they’re happy to focus on the guy” (AF).

4.5.2 Impacts of the accident analysis process outcomes

4.5.2.1 Management view the use of punishment and negative reinforcement as beneficial for both the worker and the organisation

The use of punishment to deal with accidents and the benefits offered can be a divisive topic within an organisation. Whether an individual views punishment as having positive or negative benefits can be directly linked to their role and their potential exposure to the punishment. Those in managerial positions can view punishment as beneficial. Common reasons provided for the use of punishment following an accident to manage an individual are
that it helps improve the behaviour of the individual and it ensures control is maintained across the worksite.

Though the workers are unanimous in their views that punishment following an accident is detrimental to the project, in several of the cases analysed, management viewed the use of punishment as beneficial to the organisation and its future success. In one case where the worker believed their treatment to be unfair, their management believed the punishment given made the worker a better person: “I believe the worker was treated fairly and we made the right decision. I think he is now a better bloke” (SM). The negative emotions created by an accident and the treatment of the worker are viewed as beneficial in preventing a reoccurrence, as it is believed that the experience will help the worker avoid repeating their mistake: “After an accident, anyone who is close enough to have to write a statement, there is reason for them to feel s**t after the accident. This feeling is beneficial as the next time they are doing things the same way, they will think twice when they remember the accident” (SM).

Punishment can be viewed by management as a means of maintaining order on their project. Those who do not follow the rules can be seen as rebellious or ‘bad apples’ and require dismissal as a means of sending a clear message to the workforce that any deviance from the rules is not tolerated: “If a guy is rebellious and repeatedly cannot follow the rules, he must go” (S). The use of punishment can also be deemed necessary where workers expose themselves to unmanaged risk, whether intentionally or not: “I thought the outcome was quite harsh. But at the same time, it sent a strong message to others regarding putting themselves at risk” (AF). The fear of site standards deteriorating due to the acceptance of human fallibility can drive managers to punish those who have made more than one mistake in an attempt to eradicate all error: “In relation to the worker, they were treated fairly as they had been involved in accidents before this. If people continually get away with mistakes, the site standards will slip” (SM).
4.5.2.2 Punishment causes the workforce to become rule oriented

Where punishment is used for accidents, the workforce can become rule oriented to prevent themselves from being subject to punishment for deviation from the rules. The choice to follow the rules can be a defence mechanism to remain out of the organisational spotlight. “It’s all about follow the rules and keep your head down” (W). The organisation thus loses the ability to utilise much of the expertise within their workforce, as workers become defensive practitioners who follow the rules, regardless of whether they know a better way to carry out their work. “Before, I would think on the job, but now I stick to the method statement” (W). It is the accident itself that helps workers learn from the event rather than the punishment; the punishment creates a more paperwork-oriented individual. “Even if there was no accident report, I still would have learned from my mistake. The punishment made me better at keeping my paperwork right” (W).

Many workplaces in recent years have transitioned from primarily risk-focused to primarily rule-focused, which creates the danger of the organisation and the workforce losing sight of the major risks faced: “It’s funny, because in my day, we always thought about the risk and how we would deal with it when we were doing our job. Now we are so distracted by all these rules, we often forget about the risk in our job. Common sense is gone in industry” (W). An obsession with adherence to rules can create additional costs to the project and place pressure on the project’s budget. The commercial risks faced permeate through the organisation and can emerge as health and safety risk: “We follow rules which are often time consuming and don’t help us at all but keep management off our back. All this has an impact on the budget as well, which in turn creates more risk” (W).

There is also the potential for the workforce to enforce a work-to-rule mentality where the work grinds to a halt due to the workers refusing to work outside any of the thousands of
rules to which they are required to adhere: “*For some time afterwards, the worker refused to do anything that was not strictly by the book*” (S).

### 4.5.2.3 Punishment increases risk to the organisation’s production targets

Following an accident where a form of punishment has been used, whether suspension or formal discipline, the participants can emerge with changed mindsets and perceptions of the organisation for which they work. This can be detrimental to the organisation from both a safety and a commercial perspective.

Punishment following an accident can result in reduced work efforts from the individuals subjected to the punishment due to their feelings of betrayal at the hands of their management. The worker can become less focused on the needs of the organisation and more survival oriented. Their work output can decrease due to their loss of trust in their management team. “*With my work, I just put my head down and look after number one; I don’t do any extra work because I don’t believe I’m looked after, so why should I look after them?*” (W). The reduced work effort is also evident to supervision, as are the issues which have caused the change in performance: “*The worker’s performance isn’t the same after suspension. They feel betrayed by management, like they’ve been thrown under the bus*” (S).

A byproduct of punishment, either direct or indirect, is that the organisation can lose workers who are essential to its success due to their skillset. The potential for punishment to be used to manage individuals who have been involved in an accident can result in workers choosing to leave the profession to avoid the stress created where retributive justice mechanisms are used to manage safety: “*This is the worst job I’ve been on for punishment alone. I know a lot of guys leaving the game because they can’t take it anymore. You can’t do your job because of it*” (W). The loss of talent creates several problems for the organisation. The replacement of highly experienced individuals can prove difficult as organisations struggle to identify
candidates of equal quality and can end up with less effective workers. Increased turnover of the workforce because of punishment increases recruitment and training costs. The effect of these additional costs is felt in other departments where budgets are reduced to help balance the books. These budget reductions mean the team will have to seek alternative methods to do their work as the initial proposal is now too expensive. The alternative method chosen in this situation is frequently inferior in ensuring risk is managed: “I’ve seen guys removed from a job for just making a mistake—good people. The risk increases as you have to get new people, train them and they might not be any good. The cost is also a big thing, as you end up paying more which increases risk elsewhere” (SM).

4.5.2.4 Punishment harms individuals and the ability for the organisation to learn

How an individual is treated during and because of the accident analysis process can have a negative impact on the individual’s mental state. The stress created by the process can linger with the worker for a long time after the accident: “The experience was horrendous, and I still have not recovered” (W). The stress brought on by using suspension within the process can lead to individuals requiring professional help to deal with the emotional experience they have suffered: “I was really worried about my job and whether I would be kept. It was hellish. I ended up on antidepressants. It made me really ill” (W). It is not only the workers who view suspension in a negative manner, but also their management. “The worker was stood down. It’s something I disagree with. Standing people down messes with your head and it doesn’t do anyone any favours” (S). Management visibly see the negative change within the individuals whom have been subject to suspension. “I think suspending a person puts them off and messes with their head” (S).

The threat of punishment within the accident analysis process and a blame focus following mistakes creates an environment of fear within the workforce which can result in an increase in risk across the project, rather than a reduction. One of the outcomes is that the workers feel
as if they are constantly under surveillance and make additional mistakes because of the
distraction: “I always think sites like these focus on workers too much. It makes us feel like
we’re being watched all the time and when being watched, you make more mistakes” (W).
Teams may choose alternative methods as they see management as looking for fault and
opportunities to blame. These alternative methods are not always the safest system of work
but are instead the approach which they believe will attract the least attention: “Sometimes
safety makes my job more dangerous. There was one job where we had to put up a handrail
around a trailer to take off a load. We asked the guys to take it off another way because we
knew we’d be watched, and people would look for faults” (W). The use of punishment
following an accident can have a ripple effect within the organisation, as the peers of the
individual punished become nervous when they become aware of their fellow worker’s
treatment. This can create a distraction for workers from their everyday work as they become
cconcerned that they could suffer the same fate as their peer for making a mistake: “It has a
big impact on their peers, as they see good people pushed out and they become fearful
themselves. It makes people nervous and they panic” (SM).

The fear of ill-treatment, blame and negative labelling can lead to unreported events, as
workers do not see the benefit in reporting an accident in an environment where there is great
risk to their occupations and minimal reward. Following being subject to the accident
analysis process, workers can become disenchanted with the idea of reporting in future
because of the treatment they received. “At the moment, people feel like they are going to be
blamed for an accident; they won’t report it. If I had known then what I know now, I would
not have reported it” (W). Witnessing a colleague being subject to punishment following an
accident has a negative impact on the willingness of the wider workforce to report an
accident: “I believe my case made the lads say, ‘What’s the point in reporting; you’re going
to be f****d over’” (W). Once workers have become aware of both the process and a fellow
worker’s negative experience when exposed to the process, they are less likely to report, as they feel they are likely to suffer a similar fate. “I think all this creates fear and uncertainty in the workplace. If I’ve messed up, why would I report it when I know I’m going to be set up for a disciplinary hearing, sent home and treated like an idiot” (SM). A fear of being viewed as accident prone or a repeat offender can cause individuals to refuse to report their accident. “You think, if you keep reporting accidents, are you gonna be seen as accident prone. I have seen a few people decline to report accidents because they’d rather not have their name in headlights. If nothing is said, the black mark doesn’t appear” (W).

The lack of understanding of the impact of punishment following an accident is a significant risk to organisations. The continued use of punishment to manage safety causes significant damage to both the individual exposed to it and the organisation wielding it.

4.6 Discussion

4.6.1 Strengths and limitations of this paper’s approach

This study has both strengths and potential limitations. The strength of this type of analysis is that it captures and describes the experiences of a variety of individuals operating at different levels and with varied levels of exposure.

A potential limitation is that the five cases reviewed are limited to a single organisation, which may reduce the ability for the results to be generalisable within the industry. The data analysed is also of a qualitative kind which may create scope for observer bias, as the researcher’s own theories and opinions could influence the data chosen for analysis and its meaning.
4.6.2 Discussion topics

This study was conducted to better understand the impact a retributive justice system has on the individual and future learning for the organisation following an accident. The opinions and perceptions of those involved in each of the five accident cases were used because the research team believed that, as all versions of accidents are post-hoc interpretations of the event, the views of those who lived both the event and the subsequent accident analysis process were best placed to provide clarity on the impact of the process and any knock-on effects. From the results, there are three clear topics for discussion:

- Clear rules in the policy conceal fuzzy and subjective decision making in reality.
- Language shapes and influences every part of the process and outcomes.
- Accident analyses cannot be treated as stand-alone ‘fair’ processes, separate from human relationships before and after the event.

4.6.2.1 Clear rules in the policy conceal fuzzy and subjective decision making in reality

Within an organisation, the accident analysis process and all requirements associated with it are usually captured within a document which clearly communicates the reporting, analysis and overall management requirements when an accident occurs. However, when an accident does occur within the workplace, results show that the relevance of this document is reduced significantly in favour of subjective decision making by those overseeing the process.

The personal beliefs of those who manage and provide oversight of the process are highly influential in determining both the focus of the accident analysis and the treatment of those involved. Throughout the discussions with the participants involved in this study, it was evident that the preferred style of management by the managers was ‘command and control’. Managers displayed an unshakeable belief in the rules created by management and the absolute need for the workforce to follow them. For any accident analysis, these perceptions
guide the process towards the human involved. Adherence to the rules becomes a focus point of the analysis and any non-compliance is determined as human error and a causal factor of the accident, regardless of whether there was actual risk associated with the disregarding of the rule by the worker. The blind faith in rule adherence has been proven to be highly flawed by the works of Hollnagel (2014). Hollnagel demonstrates that it is often impossible for the workers to follow rules or a plan created in an office and deviation is a natural manifestation of the expected gap between work planned and work done. This misconception shown by some managers can have dire consequences for safety. A fixation on rule adherence can become a distraction from a focus on the actual risks involved, a fact which the workers in this study highlighted. The workplace can continuously achieve high levels of compliance but be relatively poor in managing the problems which lead to human injury.

The opinions of the management in this study were that rule violation, particularly repeat cases by an individual, is not dissimilar to a virus, and the ‘violators’ were to be removed to avoid contagion. Several believed that to allow these individuals to remain on the project would be detrimental to safety and their removal would send a clear message to others as to what happens to those who do not follow the rules. These findings support the work of Dekker (2014), in that those who suffer error can be viewed as ‘bad apples’, and Douglas’s (1992) belief that the threat they are perceived to create can lead to their removal from the community. This fixation on human error by management leads to the blaming of the individuals involved in the accident, which has been highlighted in the works of Wu (2000). Prominent safety researchers such as Leveson (2004), Woods (in Woods, Johannesen et al., 1994) and Hollnagel (2014) all argue that mistakes made by humans during their work are symptoms of problems within the organisation’s system rather than being than the actual problems which require managing.
The removal of ‘bad apples’ and the blaming of individuals was not only found to occur because of misconceptions surrounding its benefits but also for the protection of personal and organisational interests. Several of the study’s participants believed that decisions were made to protect the reputations of senior managers rather than to help achieve future safety. Several cases spoke of workers being subjected to punishment to appease a stakeholder, while others spoke of the creation of a scapegoat to prevent a senior manager being implicated or tarnished by the event. These opinions were supported by the fact that, from an external point of view, there seems to be no distinguishable link between the treatment of those involved and the potential severity of the event. Instead, it appears that political drivers have a much greater influence on the outcome of the participants: it was, in fact, the cases in which there was the lowest risk to human life that the workers were treated most harshly. These issues highlight the dangers that blame poses to an organisation. While blame creates the risk of those at the sharp end losing their livelihood directly through disciplinary action, blame impacts the livelihoods of those higher up the organisational structure indirectly through reputational damage, which in turn creates an environment that drives questionable decision making. Both forms of blame can have devastating consequences to a career and to the future viability of the accident analysis process within the organisation. It is clear that finger pointing and blaming provide little opportunity to learn. The presence of blame creates an environment where information sharing is stifled following an accident for fear of the consequences, and where the provision of misleading information as a defence mechanism is far too common.

4.6.2.2 Language shapes and influences every part of the process and outcomes

The language applied to describe the components of an accident analysis process has a significant influence on both the approach taken by those directly involved in the event and by those analysing it. How we talk about and describe events influences the approach taken
and the actions decided upon. There is a belief among those exposed to the process that the language used creates the feeling of being subject to a criminal investigation. Several participants spoke of the fear that the language generated. This is significant, as fear naturally forces a human into defence mode. This defence mode can influence the person to withhold critical information following an event for fear of it being misused by those analysing the accident.

It was not only the frontline workers who believed the language to be detrimental but also members of the management team. Several managers believed that the language used within accident analysis processes generates fear for those involved and a drive to prove guilt or assign blame—beliefs shared by the frontline workers. The latter belief is strongly supported by the findings of another study, which showed that when the language used within an accident report shares similarity with a criminal investigation, the actions chosen are more likely to be human- and blame-focused (Heraghty, Dekker, & Rae, 2018). This highlights the power and influence language has within the accident analysis process and the bias it can create.

An interesting finding was that the opinions of the safety professionals in this matter differed from those of the operational team, in that they did not believe language to be a factor in the accident analysis process and its outcomes. An explanation for this could be that, because a safety professional’s exposure to the process is in the capacity of process facilitator rather than as a party involved in the accident, they have no reason to share any of the operational team’s fears, as they will never be subject to the negative outcomes suffered by those who have had an accident.
4.6.2.3 Accident analyses cannot be treated as stand-alone ‘fair’ processes, separate from the relationships before and after

It is not uncommon for the accident analysis process to be referred to as “independent”. The reasoning behind this is to communicate to all involved that the process will consider facts only and will be unbiased in its judgements, no different than Lady Justice. The reality is considerably different though, as both the inputs to the process and the outputs are heavily influenced by bias created by the relationships involved and not everyone views the process as fair.

The personal views that management have of the individual involved in an accident can be a deciding factor in the treatment of the individual and whether this treatment is positive or negative. Several participants from both the workforce and management stated that where individuals held a good relationship with management, their treatment following an event was positive. In some cases, the event was not even spoken of, to protect the individual involved. Conversely, where these personal views were negative, management admitted to using the process as a vehicle to performance manage the individual. In other cases, negative views of the individual involved led to confirmation bias within the interview process where management had already decided the individual was guilty and their line of questioning was designed to prove their belief.

When management subject their workforce to negative treatment following an accident, significant psychological damage is suffered by the individual exposed. The works on the topic of just culture by Dekker (2012), Wu (2000) and Leape (1994) all highlight the impact negative treatment can have on an individual following an accident, and the findings of this study add more weight to their views. The use of suspension was found to be extremely stressful for those involved. Self-doubt, fear and depression were all descriptions used by individuals to describe their emotions and mental state as a result of the suspension. This
highlights ethical concerns for any organisation choosing to use this process as part of any accident analysis due to its impact on the individual. It also calls into question the continued use of traditional just culture culpability models created by the likes of Reason (1997) and Marx (2001) which allow for punishment to be used following an accident. These models place an undue focus on the individual involved in the accident and can allow organisations to believe they are making just decisions due to the esteemed reputation of the model’s creators. In reality, these models are highly subjective and only add to the stress of the individual following an accident. The model inadvertently puts the individual on trial with their career in the balance after already having suffered the trauma of an accident. It is also often those who have influenced the accident who decide on the culpability of the individual, which makes it extremely difficult to remove bias from the process.

The treatment of those involved and the decisions made to deal with an event have a lasting impact on future relationships within an organisation and future learning, a finding which aligns with the just culture thinking of Dekker (2014), Merry and Smith (2001) and Ruitenber (2002). The use of suspension and punishment to manage accidents is shown within this study’s results to negatively impact future relationships within the organisation. A lack of trust can emerge due to the belief of ill-treatment on behalf of those exposed. This lack of trust leads to several negative outcomes for the organisation. Frontline workers admit to reducing their work output significantly following an event where retributive justice is used, as the loss of trust results in them offering minimal effort. Reporting also suffers due to the lack of trust. Multiple workers in this study were unwilling to report following their experiences, and believed their fellow workers were also unwilling, having witnessed their fellow employee’s treatment. Where trust has been lost, the information offered during an accident analysis can be sparse and misleading. Both outcomes are serious concerns for
organisations, as they show that retributive justice mechanisms are detrimental to both productivity and continuous improvement.

4.6.3 Implications for practice

The findings of this study show that the use of sanctions of any form as part of the accident analysis process damage the ability of an organisation to learn and to create mutual trust between management and the workforce. Both elements are crucial in the creation and maintaining of a successful organisation. The results show that the accident analysis process itself and how it is used can have serious implications for those involved.

The study also raises moral and operational concerns for organisations that continue to use retributive mechanisms to deal with error. Using a justice mechanism which has been clearly shown to be harmful to the mental state of a human must be viewed as unethical at best and immoral at worst—this conflicts with the core values of all reputable organisations.

The outcomes from this study highlight the need for safety professionals to inform their organisations of the disadvantages of an accident analysis process which uses forms of punishment. The results clearly indicate that organisations need to do more, using a science-based approach, to ensure their accidents are effectively managed and positive learnings are gained to avoid similar occurrences in the future.
Chapter 5: JUSTICE THROUGH RESTORATIVE MECHANISMS

Statement of contribution of co-authored paper

This chapter includes a co-authored paper submitted for publication. The bibliographic status of the co-authored paper, including all authors, is:


https://doi.org/10.1016/j.ssci.2021.105248

This paper has been lightly edited for spelling and grammar to ensure consistency with the rest of the thesis.

The primary author of this paper was Heraghty. Both Rae and Dekker served in the role of supervisors and were active in the conceptualisation, methodology and review stages.
5.1 Rationale for the study

The previous paper, which studied an accident process that used retributive justice mechanisms, showed that punishment can create a range of negative outcomes for both the individual and the organisation, all of which are damaging to a learning culture. This data allowed for the argument to evolve from Reason and Marx’s concepts of just culture, as both models allow for the use of punishment to manage mistakes—but what are the alternatives to this type of just culture?

There has been a growing argument that a just culture should be sought, not through models that are aligned with reductionist accident analysis styles that allow for punishment to manage mistakes, but through an accident model which allows for complexity and uses restorative mechanisms to achieve justice. Dekker (2014) proposes the use of a technique which allows for the multiple stories of those involved to be truly heard without any form of censoring. Most accident reports contain a linear story where the accident facilitator has cherrypicked the final information from the various stories of the accident’s actors. Using Dekker’s proposal, the accident report itself would contain the actors’ unedited stories within the main body, to allow them to be heard. I had for some time been concerned that the need for a linear story placed too much power in the hands of the accident facilitator, as it became their decision to determine what information provided by the actors was important enough to be accepted in the final report. As I myself had always used accident analysis techniques which required a linear story to be told, I was intrigued to know what impact this change would have, if any.

In terms of an alternative approach to safety justice, the call for restorative mechanisms to be used was receiving the strongest endorsements within the academic community at the time of this study. The issue for me was the fact that all the advocates for this change had provided nothing more than an argument; none of the research papers on this topic had provided
evidence of this approach being tested in the real world. I believed that it was important that this argument was put to the test, as the world of safety needed a legitimate alternative, supported by sound evidence, to processes which are supported by punishment. By using a restorative approach and measuring against the data used in the previous research paper, I would be able to understand whether a non-linear style accident approach supported by restorative justice mechanisms improved the ability of individuals and organisations to learn.

This study is the core aspect of my thesis and the research carried out for sections 3 and 4 was designed to support this study. While section 4 analyses the original retributive accident process within the organisation, this section involves the modification of the original process to a restorative accident process, with changes to both the approach and the language used. Through the use of the same analysis techniques used for section 4, we can compare the pros and cons of both processes.

Interviews and archival research in the form of accident reports were used as part of the ethnographic approach. The participants were more relaxed in my presence for this study, compared to that in Section 4, possibly due to change in accountability. The greatest challenge within these interviews was avoiding confirmation bias. As I was the individual who implemented the new accident process, it was important that I was not leading the participants toward validation of the process. I minimised this risk by using the same approach as in Section 4, where I read out the information sheet verbatim to reinforce my role as a researcher as opposed to a project safety professional.

Within this paper, there are a number of key outcomes which have emerged:

- The purpose of the accident process is shown to be different to what was originally thought,
- How an organisation rewards its workforce can influence their behaviour towards safety and the accident process,

- Where safety is viewed as an organisational brand, behaviours can emerge which are counterproductive to the achievement of safety,

- The approach taken by the client can have considerable consequences for the project’s culture and learning,

- It is important to consider the societal approach to justice before modifying the organisation’s system as misalignment can create a perception of unfairness.

This paper sets out to help answer the following sub-questions:

**Sub question 1.1.1** - What is the relationship between the degree of retribution and the willingness to share safety-critical information?

**Sub question 1.1.2** - What impact, if any, does language have on decision making following an accident?

**Sub question 1.1.3** - What are the unintentional by-products of an accident process which uses restorative justice mechanisms?

**Sub question 1.1.4** - How do opinions about the achievement of justice and the approach used vary between different levels of the organisation?

**Sub question 1.1.5** - Is there a distinct difference in the opinions on the justice system between those who have been directly exposed to the system to those who have not?
5.2 Abstract

When an accident occurs, the treatment of workers afterwards can have a significant impact on learning within the organisation. This in turn is a key influence on the organisation’s capacity to deal with future risk. The style of the accident analysis process chosen can have a considerable effect on the outcomes of the analysis and the treatment of those involved. In this paper, we report on the perceptions of a study that includes the design, introduction, and eventual termination of an accident process which utilises restorative justice mechanisms. Qualitative information was gathered through semi-structured interviews to gather a range of perspectives from those involved in accidents which were subject to the new system. The study found that perceptions of honesty, engagement and learning can improve where restorative mechanisms are used to achieve justice following an accident. The changes to the language used, greater inclusion of those involved in the accident in decision making, and the removal of the potential for punishment following an accident all emerged as themes which were perceived to have had a positive impact. However, the study also found that factors external to the formal accident response process have a considerable influence over the perception and execution of justice. Successful management of these factors is important for realising the benefits of using restorative justice mechanisms for workplace accidents.

5.3 Introduction

5.3.1 Overview

There have been a number of arguments put forward about the benefits of using restorative justice mechanisms when responding to workplace accidents (Dekker, 2012; Dekker &
Breakey, 2016; McCall & Pruchnicki, 2017). Some have even shown the positive economic effects created where a restorative just culture has been introduced (Kaur, 2019). However, there is very little research which captures the perceptions of those who have lived the process. There is also an absence of data to illustrate the perceptions of the change in accountability from those at different levels of the organisation.

5.3.2 A background of restorative justice mechanisms

The most widely used accident analysis tools are based on sequential, reductionist models of systems and causality (Carhart & Yearworth, 2010; Leveson, 2011). These tools are often labelled ‘root cause analysis techniques’ and seek to classify the factors that ‘caused’ the accident to occur. The label ‘root cause analysis’ implies that a single cause (or small number of causes) led to the accident occurring and can thus promote a reductionist view (Peerally et al., 2017). Reducing an accident to individual components fails to truly understand the complexity of the real world (Dekker, 2011) and can wrongly assume an effect cannot occur without a specific cause (Leveson, 2011). Humans are often the target of such causal attribution, particularly due to outcome bias (Fischhoff, 1975). This can result in accident analyses halting at the point where they assume that the human involved had complete freedom of action (Rasmussen, 1997). The upshot is that there are always humans, somewhere in the ‘chain’, who can be blamed for the accident (Dekker, 2002).

Blame can significantly reduce organisational learning (Leape, 1994; Reason, 1997; Shilling and Kluge, 2009) and work efforts (Heraghty, Rae, & Dekker, 2020), while producing an innovation-killing fear of risk (Farson & Keys, 2002; Hernandez-Mogollon et al., 2010). The individual also suffers; those who suffer accidents often feel personally responsible (Wu, 2000). With symptoms similar to Post-Traumatic Stress Disorder (PTSD), they often leave the profession without effective treatment (Dekker, 2012). Workplace blame can, of course,
have other motivations, such as settling grudges (Oswald et al., 2018), and can lead to underreporting and employee silence (Brborovic et al., 2019; Lawrenson et al., 2018).

The concept of a just culture was introduced as a means of reducing blame and increasing learning in industry. Its introduction was intended to strike a balance between no blame and accountability (Frankel et al., 2006; Marx, 2001; Reason, 1997; Stemn, Hassall et al., 2019; Walton, 2004). Anxiety had emerged due to the introduction of no-blame systems (Dekker & Breakey, 2016), as organisations feared reckless actions would be immune from accountability (Reason, 1998). In situations with no accountability, professional responsibility is sacrificed (Walton, 2004). The idea of a just culture has been widely accepted (Cromie & Bott, 2016) and has been introduced to a range of sectors, such as the aviation, healthcare, nuclear and rail industries (Boysen, 2013; Pattison & Kline, 2015; Schwarz and Kallus, 2015; Von Thaden et al., 2006). There are, however, a number of concerns regarding the just culture and their impact on a learning culture.

First, the models created by Reason (1997) and Marx (1997), though pioneering, rely on a reductionist accident analysis, which have trouble acknowledging complexity (Dekker; 2011; Rasmussen, 1997; Snook, 2004). For a person’s actions to be passed through the culpability model, the accident must first be broken down into a chain of events. This oversimplifies the accident and excludes the system factors and the non-linear aspects of the event (Leveson, 2011), such as the decisions made deeper within the system which influenced the actions on trial (Rasmussen, 1997). Secondly, retrospective accountability, which the Reason culpability model unintentionally allows for, is susceptible to hindsight bias (Dekker, 2012). The term ‘reckless violation’ is only ever placed on an action after something bad has resulted. This can be seen as unfair, as the judgement is based on the outcome rather than the action itself. Perceptions of unfairness or blame can cause reporting to reduce dramatically (McCall & Pruchnicki, 2017) as it becomes viewed as a risk to one’s livelihood. Though well intended,
the just culture models proposed by Reason and Marx could inadvertently help create the antithesis of what they set out to achieve—an organisation that can learn.

There have been appeals for restorative justice mechanisms to be used within accident analysis (Dekker, 2012). Restorative justice is a process where all of those affected by an injustice have an opportunity to discuss the damage done and to decide how best to repair the harm (Braithwaite, 1989). A common misconception is that restorative justice is the opposite of retributive justice (Daly, 2002). On the contrary, many of the outcomes which emerge from a restorative approach to justice could be legitimately perceived as punitive by those involved (Barton, 2000). The reparation of harm and the actions required may be experienced as a form of punishment or shame by the actors subject to them (Daly, 2002). However, a key difference between retributive and restorative justice lies in the mechanisms by which accountability is attained.

Retributive mechanisms are intended to answer pain with pain, whereas restorative mechanisms are used to work towards constructive outcomes (Wright, 1991) which can prove beneficial for the community. These two types of accountability can be referred to as retrospective and prospective (McCall & Pruchnicki, 2017). The retrospective accountability focuses on ensuring individuals pay their due for their wrong (Hare, 1986) and not on addressing any of the issues found within the system (Liang, 2001). Conversely, prospective accountability establishes the actor’s accountabilities for future action (Rivard & Carroll, 2003). Retrospective accountability fails to take into consideration how complex organisational systems are and that safety and accidents are emergent properties of this complexity (Yang et al., 2017). Processes which allow for retrospective accountability, such as Reason’s culpability model, can encourage more human-focused accident analyses which can lead to engineering and system solutions becoming deprioritised (Henriksen & Kaplan, 2003). Prospective accountability holds people to account, not through blame, but by
ensuring the actors involved provide their account (Dekker, 2012). Accountability needs to become less about who helped cause the issue and more about how the issue needs to be resolved (Sharpe, 2003). In this way, those involved in the accident are not viewed as the problem but as those people who are best placed to help solve the issues which caused the event.

None of the current work in the areas of retributive or restorative accident approaches place much focus on the power of language and framing within these approaches. The accident process itself and how it is written can also influence the facilitator’s approach and lead them to write a report biased towards the humans involved (Vesel, 2012). How the event is described is also shown to impact the reader’s decision making (Heraghty, Dekker, & Rae, 2018; Thibodeau and Boroditsky, 2011). Linear stories using agent-driven language are shown to trigger an increase in human-focussed actions, compared to non-linear, system focussed reports. This highlights the need to take language into account when creating an accident process.

5.4 Research question

This paper presents a case study of a change from retributive justice mechanisms to restorative mechanisms within the accident process of a construction project in the United Kingdom. In Section 5.5, we describe the methods used to create the environment needed to carry out a case study, the data collection process and the method used to analyse the data. Section 5.5 can be broken down into three sub-sections. Sub-section 5.5.1 describes the case study itself, the changes made to the accident process and how these were communicated to various levels of the organisation. Sub-section 5.5.2 discusses the data collected and the methods used to source this information. Sub-section 5.5.3 illustrates how the data was analysed and the logic behind the approach taken. Section 5.6 presents the results of the
survey and the themes which emerged from the interviews with the 21 participants in the study. Section 5.7 analyses the data and determines the implications these findings have for the industry.

The question we set out to answer with our study is: “What impact does a change in the accident process and the justice mechanisms used have on the perceptions of those exposed to it?”.

5.5 Methods

This is an action research study in which the first author was directly involved in the design, introduction, and eventual removal of a restorative justice process. The study was carried out over eight months.

The ‘organisation’ referred to in this chapter is a joint venture between two construction companies which are carrying out construction works on a major project. The ‘client’ is both the principal contractor overseeing this project and the customer who is paying for the works to be carried out. The senior leadership team members discussed are those of the joint venture itself and not those who oversee each of the parent companies at a corporate level. Neither parent company corporate leadership team had any direct involvement in this study. Those listed as having received training in Table 5 represent the entire joint venture organisation.

5.5.1 Accident process modification case study

An accident analysis process infused with restorative justice mechanisms was introduced to the organisation to replace the old process which contained retributive justice mechanisms. The process and its required delivery were captured within three documents and communicated using three methods. The documents and communication methods can be found in Tables 2 and 3 below.
Table 4: New Accident Process Documentation

<table>
<thead>
<tr>
<th>Document</th>
<th>Document Intent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident and Work Exploration Standard</td>
<td>The standard communicates the key components of the accident exploration process.</td>
</tr>
<tr>
<td>Achieving a Just Accident Exploration Procedure</td>
<td>The procedure was designed to provide a step-by-step process for the management team to follow to ensure fairness was achieved for all involved.</td>
</tr>
<tr>
<td>Accident and Work Exploration Guidance</td>
<td>The guide contained useful information for the accident exploration facilitator when conducting an accident or work exploration.</td>
</tr>
</tbody>
</table>

Table 5: Accident Process Communication

<table>
<thead>
<tr>
<th>Communication Method and Title</th>
<th>Target Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop – Achieving a Just Accident Exploration (90 minutes)</td>
<td>Client Health and Safety Professionals (3 personnel), Senior Leaders (6 personnel), Project Leaders (7 personnel), Operations Managers/Supervisors (58 personnel), Health and Safety Professionals (12 personnel), Union Representatives (3 personnel)</td>
</tr>
<tr>
<td>Toolbox Talk: A Positive Approach to Accidents (20 minutes)</td>
<td>Operational workforce (Approximately 350 personnel)</td>
</tr>
<tr>
<td>Presentation: Accident and Work Exploration Delivery (60 minutes)</td>
<td>Health and Safety Professionals (12 personnel)</td>
</tr>
</tbody>
</table>

The accident process modification consisted of several key changes from the original process. The most significant changes are listed below.
5.5.2 Removal of suspension and punishment from the process

The use of suspension and other forms of punishment were removed from the process as they had been shown to cause psychological damage and negatively impact future safety (Heraghty, Rae, & Dekker, 2020). The following was included in the modified process:

“Those involved in an accident are dealt with in a positive manner without the use of punishment or any other form of negative treatment at any stage of the process.”

5.5.3 An adjustment of the language used to describe the process

The language used as part of the accident process has been shown to influence both participation (Heraghty, Rae, & Dekker, 2020) and decision making (Heraghty, Dekker, & Rae, 2018). Much of the language shown to have negative connotations was removed. Table 6 contains some of the key changes made to the process involving language and framing.

**Table 6: Key Process Changes**

<table>
<thead>
<tr>
<th>Old Process</th>
<th>New Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incident Investigation</td>
<td>Accident Exploration</td>
</tr>
<tr>
<td>Interviews</td>
<td>Discovery Sessions</td>
</tr>
<tr>
<td>Root Causes</td>
<td>Factors which jeopardised success</td>
</tr>
<tr>
<td>Corrective Actions</td>
<td>Solutions required for factors which jeopardised success</td>
</tr>
</tbody>
</table>

5.5.4 Acceptance of multiple stories and moving away from reductionism

Traditionally, accident reports tend to be linear and reductionist in nature. The original accident process required one story to be told and the root cause to be determined. The modified process included the following to minimise any bias which can occur when selecting the important information from the stories of others: “Discovery Sessions: Insert the stories of each of those involved in the event. Ensure each story is inserted word-for-word.”
The issues sought were no longer the ‘broken’ components which were deemed to have caused the accident but were instead the issues which made work difficult: “The participant must highlight the activity elements they believe made the job difficult to complete.”

The focus was no longer solely on failure potential. There was also recognition that even though there was an accident, not everything was wrong: “The participant must highlight the activity elements they believe to be successful.”

5.5.5 Inclusion of the workforce in the creation of actions

Prior to the accident process modification, the accident analysis team was made up of safety professionals and management. “The Project Leader or a nominated senior member of the team must be involved in the investigation, report production and briefing of the team on any lessons learned. They should involve the HS&E Adviser where possible.” (Sourced from the organisation’s original incident investigation process)

None of the accident reports carried out on the project prior to the process modification had workforce involvement in the creation of the actions. As a means of improving the quality and useability of the actions determined following an accident as well as attaining prospective accountability, the new process included the following (summarised):

All Work Explorations will be reviewed by a Report Review Panel. This panel will:

- Review the findings and determine whether sufficient information is provided
- Ensure the Achieving a Fair Accident Exploration Procedure has been followed
- Confirm actions for the issues found and appoint responsible persons to implement each action within a set time frame.

The panel will include the following personnel:

- Project Leader
• Supervision
• HSE Manager/Advisor
• Relevant Subject Matter Expert, e.g. Temporary Works Coordinator or Lifting Appointed Person
• All involved in the event.

As the process only covered events where the outcome was unintended, the following was included in the process: “An accident is where a worker was conducting normal work when an unintended consequence occurred or had the potential to occur. Events that involve intentional negative consequences, e.g. sabotage of equipment, will not fall under this standard.”

5.5.6 Management of the process

The accident process was managed by the health and safety team with oversight provided by the Health and Safety Systems and Improvements Manager (the first author). A total of 12 safety professionals, six senior leaders, seven project leaders and 58 managers were educated in the process. A total of five accidents, which were subject to the modified accident exploration process, occurred during the eight-month study period.

5.5.7 Termination of the study

Approximately eight months after the accident process was modified, senior members of the organisation determined a need to move the accident process away from restorative mechanisms, which led to the termination of the study.

This was an unexpected and drastic change, the reasons for which are discussed further in Section 5.6.3.
5.6 Data collected

5.6.1 Interview overview

The data for this research was accumulated using a semi-structured interview approach. This approach was used because the aim of this research was to understand the lived experience of those involved in accident processes, and qualitative interviews have been found to be a “powerful tool to capture the voices and the ways people make meaning of their experiences” (Rabionet, 2011). Both Kvale’s *Doing Interviews* (2007) and Creswell’s *Research Design* (2013) heavily influenced the approach to designing the interviews.

The questions were open-ended and included language and framing which was as objective and neutral as possible to minimise any confirmation bias.

The questions below were those that were asked of each participant during each discovery session, though not always in the sequence below, as sometimes the participant started by answering Question 3 before moving on to Question 2. As discussed by Adams (2015), conversations within semi-structured interviews often do not follow the sequence of questions, as it is important to maintain the flow of the conversation.

Q1. How does our current safety justice system impact trust and learning in the workplace?

- Compare with previous experiences in different workplaces
- Thoughts on the language used to describe the process

This question was posed first because, according to Adams (2015), it can be helpful to start with the question that appears least threatening to the participant. This question allowed the participant to start with their overall view rather than a personal experience. Discussing trust is important as it has been shown to impact individuals’ willingness to engage (Heraghty,
Rae, & Dekker, 2020; Leape, 1996; Ruitenberg, 2002; Wu, 2000). The language aspect was asked to determine whether the language and framing of the system influenced perceptions in a similar manner to that shown by Thibodeau and Boroditsky (2013). The sub-question on previous experiences emerged as a result of the initial participants choosing to raise this topic within their sessions.

**Q2. Give us your opinion on the safety reporting culture on the project.**

- Willingness to report
- Action taken
- Treatment of those who report
- Treatment of those involved in the issue

A reporting culture is deemed an essential element for organisational learning (Reason, 1997) and how a person is treated once they have reported can influence future reporting within an organisation (Dekker, 2012). The sub-question discussing the action taken emerged when participants brought this topic into the initial discussions when discussing the reporting culture.

**Q3. Provide me with your views on your own experience of the accident process and how justice and learning is achieved following an accident.**

- The outcome
- The methods used to achieve them
- The treatment of the people involved

All those who participated in the discovery sessions had been involved in the accident process. This question set out to understand the experiences of those at different levels of the organisation involved in the accident process. As reported in previous research (Heraghty, Rae & Dekker 2020), it is not just the outcome that can influence organisational learning, but also the process itself and how people are treated during it.
Q4. Tell me of a time you believed a safety injustice occurred in the workplace, either to you or somebody else.

- How did that make you feel?
- How did it affect the workplace?

This question was designed to understand the impact that perceived safety injustices have on an individual and the workplace, as the works of Wu (2000) and Dekker (2012) both highlight the damage that blame can have on an individual and, in turn, the organisation. This question often merged with Question 1, due to the participant using a specific experience to describe how past systems differed from the current one.

Q5. Is there anything else you would like to ask me?

To ensure the participant was given every opportunity to provide their unfiltered views and to have full confidence in the process, this question was always asked at the end of the interview.

5.6.2 Participants

The actors from the five different accidents were chosen for participation in qualitative interviews. Five was the total number of accidents which occurred during the study period, and thus 100% of those who were exposed to the modified process were captured in this study (with the exception of the client, who declined to participate).

For each accident report, a semi-structured interview was carried out with the following personnel:

- The worker who was carrying out an activity when they suffered an accident
- The worker’s supervisor
- A support function involved (safety professional, discipline specialist)
- The senior manager who approved the report and its related actions.
A total of 21 discovery sessions (semi-structured interviews) were conducted within the organisation. A breakdown of these can be found in Table 7 below.

**Table 7: Post-Accident Discovery Session Participants**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Number of discovery sessions (semi-structured interviews)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The worker who was carrying out an activity when they suffered an accident</td>
<td>6</td>
<td>None</td>
</tr>
<tr>
<td>The worker’s supervisor</td>
<td>5</td>
<td>None</td>
</tr>
<tr>
<td>Discipline specialist</td>
<td>5</td>
<td>2 * Safety Professionals</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 * Engineer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 * Lifting Appointed Person</td>
</tr>
<tr>
<td>The senior manager who approved the report and its related actions e.g.</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td>Construction Leaders/Project Leaders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The senior leaders whose decision it was to end the trial (Director Level)</td>
<td>2</td>
<td>2 * Organisation Senior Leaders</td>
</tr>
</tbody>
</table>

5.6.3 Qualitative interviews with leaders who determined the need to alter the modified accident process and end the trial

Semi structured interviews were carried out with the following personnel due to their involvement in the termination of the trial:

- Organisation Senior HSE
- Organisation Senior Construction
Members of the client team were invited to participate but declined the invitation. All information attributed to the client is based on conversations that occurred between the first author and the client.

5.7 Data analysis

There is no objective way to examine an organisational justice process. Every version of events, including the official reports and the researcher’s account, is a post-hoc interpretation of what happened. With this in mind, the research team believed that the most suitable way to gain a better understanding of the organisational justice process was to analyse the experiences and perceptions of those who oversaw the process and those who lived it.

The data was analysed using the thematic analysis approach defined by Braun and Clarke (2006). Emerging themes were related to each other according to axial coding (Corbin & Strauss, 2008). There were four phases in the process:

**Phase 1** The first author familiarised themselves with each of the 21 semi-structured interview transcripts by thoroughly and repeatedly reading through them.

**Phase 2** The transcripts were scrutinised for emergent trends and where there were shared opinions across several transcripts, each individual’s discourse was taken and grouped with others that shared the same view. This helped generate the initial themes. For example, the importance of a transparent process emerged as an initial code through phrases such as:

“The process was really good. Our Project Leader kept us in the loop all the time about what was happening.”

“With this accident, we were clearly told that they were not looking to blame but just wanted to learn. Hearing this helps you share as you have no fear.”
In some cases, the same quote from a participant existed in multiple themes as it was accepted that it related to more than one theme. For example, the following quote was placed within the ‘transparency of the process’ theme and the ‘past experiences’ theme as it related to both:

“It was funny because both of the other guys blamed the supervisor. Once we explained nobody was going to get sacked, they changed.”

**Phase 3** Following the initial grouping of commonalities into themes, these themes (of which there were 15) were further grouped based on commonalities between the themes. This resulted in the seven final themes seen in the article.

At this stage, some of the participant quotes in the initial themes migrated into other themes outside of the associated final theme as they were more aligned with one of the other final themes. An example of the grouping of initial themes is illustrated in the figure below.
**Phase 4** Once the final themes had emerged, they were placed into categories. The categories were identified with the help of a previous article we wrote on the perceptions of a retributive accident process (Heraghty, Rae, & Dekker, 2020) in which similar themes to those identified in Category 1 also emerged.

All opinions provided by those involved were treated equally, regardless of their role, and all opinions were assumed to be true experiences of the participants. When coding, both similarities and inconsistencies were highlighted to help draw conclusions about the process. The descriptions and organisation of these concepts were openly discussed among the authors before finalisation to ensure each quote was an accurate reflection of the theme with which it was associated.

**5.8 Results**

When analysing the results, there were two clear categories:
• significant influences on the outcome where the changes made to the process were not a factor, and

• emergent properties of this study and the changes implemented.

These categories each contain themes, all of which are captured in the tree diagram below.
Figure 4: Categories and Themes

- **Topic:** Modifying an accident process and its justice system

  - **Categories:**
    - Significant influences on the outcome where changes made to the process were not a factor
  
  - **Themes:**
    - The initial treatment of individuals following an accident has a strong bearing on perceptions of the process and future reporting
    - The transparency of the process throughout the accident analysis is crucial to both current and future participation
    - Past experiences continue to influence perceptions and actions even when there is a change in process
    - A change in the accident process doesn’t necessarily reduce the impact of external pressures and political decision making
    - Emergent properties of this study and the changes implemented
    - Including the workforce in the decision making improves the organisation’s ability to learn
    - Moving away from blame and punishment increases honesty and engagement
5.8.1 Significant influences on the outcome where the changes made to the process were not a factor

5.8.1.1 The initial treatment of individuals following an accident has a strong bearing on perceptions of the process and future reporting

How a person is treated once they have reported an accident can strongly impact future reporting. Whether a person is willing or unwilling to report issues in the future can depend on how they were treated at the time of reporting. A positive reaction from the supervisor can help create a culture built on trust and honesty. Equally, reactions or components of the process perceived as negative can erode trust and cause serious issues to be driven underground.

A negative reaction by the line manager has a significant effect on the team’s willingness to report issues. A positive and non-judgemental approach can reduce any preconceived fears within the team and encourage honest reporting: “I can’t really say for everyone, but I know my guys are happy to report issues because I don’t lose my cool. It depends on the management you have” (Supervisor). On the other hand, an undesirable reaction can fuel a fear of reporting: “I still believe that our reporting is not great. There is still a lot of work to be done with supervision as they are still very old school and sometimes throw their hands in the air and say, ‘What have you done now?’” (Worker). There can be significant inconsistencies between managers in the reaction to a report which itself can be damaging to a reporting culture. “The treatment of people depends on who they report to. Some are open to a report and are positive fixing it. This drives a reporting culture. Others react defensively which kills the reporting culture” (Senior Leader).

It is often external pressures which drive poor reactions to accident reports. Fear of how they will be treated following the communication of the accident can create a negative response
from the manager: “Some management react badly and try to hide it. I think they do this because they fear the consequences” (Supervisor). Perceived reputational damage can result in some managers viewing accident reports as a personal attack and a risk to their livelihood: “People are not always treated well, as some managers take it negatively and personally. It’s almost as if it’s a black spot on their record” (Worker). Pressures arising from a tight work schedule and insufficient resources can cause a manager to react to a report in a manner which does not align with their normal approach, but which has a detrimental impact on the reporting culture within their team: “Quite often it’s the pressures of the job that does it. When you are flat-out busy, you do not want to hear more problems. They might not even mean the reaction, but it has a lasting impression on those who report as they say, ‘Why should I bother if that’s how they react?’” (Worker).

Perceived negative treatment following the reporting of an event can also extend to a system requirement. The use of mandatory drug and alcohol tests for all personnel directly involved in an accident can be viewed as the workers being treated like criminals: “After the accident, everyone in the vicinity was told to down tools and was sent for a drug and alcohol test. I felt like a criminal” (Worker). The testing process can give the impression that the focus of attention is solely on the individuals involved and a desire to blame: “The D and A [drug and alcohol] test makes it feel like you’re looking to blame someone” (Worker). The requirement for a drug and alcohol test following an accident may give the participants the idea that they are being reprimanded for suffering an accident: “Because the guys had to do a [client required] D and A test after the event, this would make you feel like you’re in trouble. This may have influenced their belief they were stood down” (Senior Leader).
5.8.1.2 The transparency of the process throughout the accident analysis is crucial to both current and future participation

The level of communication provided throughout the accident process influences the perceptions of those exposed to it and their willingness to participate. The amount of information issued to those who are involved in the analysis can eventuate in positive outcomes for both the individual and the organisation when it is provided early and continued throughout the process. Conversely, a lack of communication with those involved can result in individuals misinterpreting aspects of the process and the creation of a negative perception of the entire process.

Providing those who have suffered an accident with a clear understanding of the process as early as possible can reduce any pre-existing fears: “There was no finger pointing and blame. You’re not afraid to lose your job as you’re told in the beginning that this process is not focused on blame, it’s about learning” (Operator). The information provided prior to the commencement of the accident analysis can influence the level of engagement provided by the individual: “The processes were positive and good because we were told there would not be blame. I think the guys are more honest without blame involved as they can say what they want without fear” (Worker). Full transparency can also extinguish any negative pre-existing opinions. “I do think it takes more than language to get people to open up, as unless they know they won’t be treated badly, they’re going to be suspicious” (Senior Leader). The continuation of positive communication throughout the process can leave the individuals involved with a positive opinion of the process. “The process was really good. Our Project Leader kept us in the loop all the time about what was happening” (Worker).

Poor communication of the process can result in a poor perception of the process and even the use of an alternative process. “Before the accident exploration process, the old process
wasn’t clear. So any event I had, I investigated it the way we do it where I’m from” (Senior Leader). Where communication during the process is non-existent, those exposed to the process can misinterpret the treatment they are receiving and its intent. One of the workers believed they were stood down from work because of the accident—“I was stood down for a week until the accident [investigation] was over” (Worker). However, this was not the case: “I know for sure they were not stood down, but I don’t know how clearly that was communicated to the guys” (Senior Leader). A lack of communication can have a negative impact on the worker’s mental health: “The whole situation made me feel very low. I was depressed. I sat in the office for three days not knowing what the outcome was going to be for me” (Supervisor).

5.8.1.3 Past experiences continue to influence perceptions and actions even when there is a change in process

The past experiences of those who are subject to the accident process and those who oversee it can affect their current attitudes. Negative approaches and poor treatment can have a lasting impact on those involved and it may take more than a process change to rectify the damage caused. Past experiences can also influence those overseeing the current process and a reversion to a more familiar process can easily occur when the new process is initially introduced.

Workers who have been punished in the past struggle to accept it when they are told that punishment will no longer be used to deal with accidents: “Even though we say we don’t punish people, some people still don’t believe it, because of their past experiences” (Supervisor). This can impact the level of honesty from them following an accident: “Guys who’ve been treated badly by these processes are still suspicious of being honest” (Senior Leader). As well as experience, the person’s employment background can also impact their
trust of the process. “A lot of guys come from self-employed backgrounds where if you report something, you’re finished” (Worker). All of this can make it more difficult to persuade people of the benefits of the process: “I think it required a lot of persuasion and convincing them that the focus was on the system and not the individual. I think these guys have a lot of scars from their past based on how they were treated and how their work colleagues were treated” (Support).

Previous experience can also guide a person’s actions during the process. A fear of job loss can result in survival tactics by those involved: “It was funny, because both of the other guys blamed the supervisor. Once we explained nobody was going to get sacked, they changed” (Senior Leader). Those involved can initially be defensive because of their expectation of the process. “It was funny, as our supervisor came in halfway and was defensive until he realised no one was to blame” (Worker). The accident analysis team can step outside the process and return to a previous one out of habit, with damaging results: “I think because previous processes had stood people down, we just followed suit” (Senior Leader). Previous approaches can prove difficult to shake off, particularly the aspects viewed as swift and beneficial: “The culture here is people like to point fingers. I think it’s because it’s all they know. They’ve always done it that way. I think a lot of it is because they want a quick solution to the issue. It’s how they’ve always done it” (Senior Leader).

It is not just the operational team who can struggle following a change in process but also the safety professionals facilitating the process. The safety professional may revert to their experience when carrying out their discussions with those involved in the accident and give the perception that the individual is accused of a crime: “The discovery sessions were intimidating, as I felt like the safety advisor was interrogating me. It made it look like they were looking for someone to blame” (Worker). The familiarity with probing the witness can result in confirmation bias creeping into the process: “This was the first time we were doing it
and it sometimes felt like the safety advisor didn’t always know what they were doing and some of the questions being asked seemed a little leading” (Senior Leader). Some of the safety professionals spoken to readily admitted the difficulty in changing their approach: “I would also reiterate the no-blame requirement to myself as it would have been very easy to fall back into interrogation techniques. It was difficult as an interviewer to change my old language and framing as I was used to asking direct questions. It was difficult to try and ask more open questions” (Support).

5.8.1.4 A change in the accident process does not necessarily reduce the impact of external pressures and political decision making

When an accident occurs within an organisation, the approach taken by some of the stakeholders involved can have political undertones. Removing blame and punishment and introducing restorative justice mechanisms does not automatically reduce this style of approach. A fear of reputational damage and a willingness to use the process to exert authority can both seriously impede the benefits provided by the change in process and the willingness to trust it.

Pressure to achieve an aggressive work programme can lead to management becoming over-zealous in their quest to return to full production at the expense of learning: “There is a big storm after the event but once it blows over, everyone just gets on with the day job but forgets about the actions. It is almost just ‘When can we go back to work?’ The focus quickly turns back to programme” (Support). Risk can be viewed as acceptable as long as it allows the target to become more achievable: “With the pressure on the job because of the programme and fixed deadline, people were subconsciously accepting more risk, as the deadline was what we were being rewarded for” (Supervisor).
The process can be used by members of the client to demonstrate their authority over the contractor and to increase their profile within their own organisation: “We also had the added problem of the client placing time constraints on the process and the actions” (Senior Leader), and cause harm to the individual involved in the accident: “Also as the process was new and the client wanted an immediate response, we decided to stand him down” (Senior Leader). Issues can be escalated not because of the risks involved but because of the interaction between the client and the contractor: “The thing I will say is that the event itself was not even a near miss. It was an improvement opportunity at best. The only reason it became a report was because the regulator didn’t like it and the client panicked and demanded a report. It got escalated because our supervisor got narky because they came into his area” (Supervisor). Accident reports and the request for their completion can be a means to demonstrate a safety conscious approach to their employer: “I think there is a fear culture in the client where they have to justify their existence. They demand reports for everything to make it look like they’re proactive, and they demand fast reports to show management they are on it when it comes to safety management” (Support). Using safety as a reason for pressure and stoppages can be viewed as a means of exerting authority concealed behind a moral justification: “The client is using their position of power, exploiting it and abusing it and making stupid requests. It’s a status thing for them, and they use safety as a tool to demonstrate their authority” (Support).

The closing out of actions can suffer where politics and hierarchy are allowed to interfere with the process. Individuals in senior positions can disregard the actions associated with their departments because there is nobody more senior than them to hold them accountable: “The actions were more difficult to close out, as they were always bigger problems and needed senior people’s support. I don’t think we had top level support, particularly if it affected their areas” (Senior Leader). Reputational damage can be a factor where senior
leadership refuse to accept actions associated with their area in case it casts their department in a negative light: “The organisation-wide actions were a different story. Accountability was missing for some of the big ones. Some got watered down because they were too hard. People in other departments often become defensive about their own departments and refuse to admit there’s a problem” (Support). The result of this behaviour can be a loss of trust in the reporting system: “There’s no accountability to fix actions, which means everyone loses faith and stops raising problems” (Senior Leader).

5.8.2 Emergent properties of this study and the changes implemented

5.8.2.1 An adjustment of the language and framing used can help alter perceptions of the process

The language used to describe the accident process and how it is framed can have a significant impact on the perceptions of those who are exposed to it. Language viewed in a positive light can create an open conversation while language viewed negatively can create a climate of fear where there is little potential for learning.

The language used to describe the previous process, using phrases such as ‘incident investigation’, can build negative perceptions of the process and its intent. Participants believed that this language had induced a defensive approach in which learning was minimised because people did not provide full information, for fear of retribution: “With the old language, it was police style, and people were already preparing their answers because they were in defensive and survival mode. The style of language of old investigations led to the guys thinking ‘I need to say as little as possible here’” (Senior Leader). The fear created can also cause those under the spotlight to provide misleading information to avoid attention: “When you’re under investigation, you’re in survival mode. You’re saying things to reduce blame and divert attention away from you, so that you can keep your job. There are no
learnings which help us improve” (Supervisor). Those most exposed to the process may view it as a personal attack: “The incident investigation language feels very personal and the focus is on you instead of the event” (Supervisor).

A change in language can have a positive effect. The perception of the intentions behind the process and where the focus will be can shift: “I do think that an incident investigation is more about the individual and an exploration is more likely to focus on the accident and what we can learn” (Worker). This can reduce fear of the process: “I think with the language, it made the process less confrontational. The language put forward the case that it was part of a learning opportunity which made the guys less fearful” (Support). With less to fear, those involved can become more open and honest: “The language and the framing is very important. The exploration process makes people open up because they feel more comfortable and are more forward coming (forthcoming). With incident investigations, it scares people. The language makes people want to say nothing” (Supervisor). This improvement in openness and honesty can lead to increased learning from events: “I think the language and framing in exploration allows people to be honest and we’re more likely to learn the real problems” (Senior Leader).

The ability to understand is also important when determining the most suitable language. A lack of understanding of the language presented can be just as intimidating as words with negative connotations: “We need to stop using big words like ‘investigation’. What’s actually intimidating is language the guys don’t understand” (Worker). Simplifying the language used can go a long way in helping people understand the process and in improving learning. “I keep telling people to stop using fancy language, as for most on this job, English is a second language and needs to be as simple as possible, no jargon. Unless people understand it, they won’t know, and we won’t learn” (Senior Leader).
In our previous work (Heraghty, Rae, & Dekker, 2020), we suggested that a change in language would affect perceptions. Based on our findings in the area of language, this theory has been validated.

5.8.2.2 Including the workforce in decision making improves the organisation’s ability to learn

The level at which those who have suffered an accident are involved in the subsequent analysis can influence the learning potential for this and future events. Viewing those involved as assets to the process can provide improvements in a range of areas, including workforce empowerment, viability of actions, action implementation and future reporting of events.

Involving those who carry out the work in the decision making process is viewed as essential in ensuring the actions chosen are aligned to the work and beneficial to those who deliver it. The understanding the workers have of their work is crucial in determining the type of actions required: “Having the guys involved in the actions was good because only they truly understand the accident so they can help come up with the real actions. Those outside of the job don’t really understand the inside of the job” (Support). Actions decided on through collaboration with the workforce are more useful than those decided on without: “The actions involved helped prevent reoccurrence and those involved in the exploration process had a say on the actions, which meant they were useable” (Support). When the workforce is involved in the determination of the actions, the actions are much more likely to be accepted by their peers: “The process to decide the actions was good as you had the right people in the room, the doers, who decided what to do. It meant much better buy in” (Supervisor). Actions created by those who do the work are viewed as successful by the workforce: “It was us who put forward the actions needed. These actions have now made our life easier and the job
much safer” (Supervisor), and those who oversee it: “In this case, the workforce was heavily involved in the actions which helped us improve our work set-up process” (Senior Leader).

An empowered workforce has been shown to be a critical component of all organisations which achieve sustainable success. Involving the workforce in decision making following an accident increases engagement and self-learning: “I do think having the guys involved in creating the actions and closing them is positive. Whenever you’re involved in a process, it becomes more powerful—it becomes a self-learning circle and self-improving. The guys are more engaged, and you break barriers down. They realise we care” (Senior Leader). The decision-making process can be an exercise that helps to increase team morale: “We were all involved in deciding the actions. It was great, as it felt like a team effort. It was collaborative and it puts everyone at ease. You also get better actions, as it’s us guys who know the real issues and it’s us who will tell you what works and what doesn’t” (Supervisor).

Workforce involvement in the decision making can also have a positive impact on their willingness to report in future. Having the workforce in the room can reduce any fears of the process: “People left the room less fearful of accident reporting as they saw it as a positive experience” (Worker). Further, the experience of those involved can increase their inclination to report: “Now that I’ve been through the process, I’m much more comfortable reporting accidents as I know there is little to fear” (Operator). Positive experiences for those who are involved in the process can increase reporting through word-of-mouth: “I think the process has a big impact on reporting, as guys talk and when you tell guys it’s a fair and positive process, they are more inclined to report” (Supervisor).

5.8.2.3 Moving away from blame and punishment increases honesty and engagement

The use of punishment following an accident is a much-debated topic across industry, with arguments put forward both for and against its use. There is often a symbiotic relationship
between the treatment of those involved in the accident and the willingness of the workforce to engage in the process. The use of blame and punishment can create difficulties in understanding the event because of the fear these mechanisms cause. The removal of blame and punishment can allow those involved to be honest without fear of reprimand.

Prior to the change in the accident process, blame and punishment were often used when dealing with the people involved. The use of punishment could be mistakenly viewed as the action required to help prevent reoccurrence, leaving the real issues unmanaged: “With the supervisor I spoke of, there was no learning as the supervisor got kicked off and that was deemed the action. They never fixed the actual problem” (Worker). The process can be perceived as threatening and this creates a wall of silence which severely restricts any potential learning: “The engagement with the previous accident, it was all negative, so nobody spoke up” (Worker). Finding individuals willing to participate with openness and honesty can prove difficult: “With our previous process, it was difficult to find witnesses, as people were reluctant to say they were involved and those who did give information were defensive and gave short answers. They were going on the philosophy of ‘the less I say, the less I get in trouble’” (Support). The threat to their own job security and that of their peers can eradicate any reporting culture which may have previously existed: “They accept the outcome, but I think the impact is that people become better at not getting caught. Reporting goes under the carpet as people won’t dob on others because it could mean they lose their job” (Senior Leader). Those still willing to use the system may use it not for safety purposes but for settling a score: “Nothing good came out of sacking the guy. No learning was gained. In terms of reporting, the system became a blame system. Observations were given to the client to get back at supervision” (Supervisor).

Removing blame and punishment from the process can increase the willingness to be open and honest. Moving away from blame can increase the sharing of critical information: “You
don’t feel threatened, and as a result you’re much more honest because you don’t feel like you could lose your job” (Supervisor). The level of involvement from the workforce can increase: “The guys felt empowered, and as a result contributed much more than they would if blame was in place” (Worker). The process can feel much more positive for those involved: “The workforce really liked it, as it moved away from blame. It was a more enjoyable experience as people were more involved” (Senior Leader). A positive outcome can be a workforce who are more willing to report: “I believe the guys are happy to report, as nobody gets sent to the gate for issues raised and there’s a genuine learning culture on site” (Support). They may even begin to feel enthusiastic about participating: “I think the exploration process changed a lot of guys’ perceptions on an accident. The guys were reluctant at first but then became enthusiastic, as they saw it as a positive approach with action” (Support).

The removal of punishment can lead to a natural shift in focus as to where the issues exist. The focus can become less about the humans involved and more about the problems which led to the accident occurring: “The process meant nobody could be blamed and we were all focused on fixing the issues” (Supervisor). The result can be the unearthing of more meaningful, systemic problems: “I think old investigations rarely scratched the surface of process issues, whereas exploration processes go much deeper” (Senior Leader). The change in process can help guide those who are more naturally inclined towards blame because of their beliefs and past experiences: “I think the exploration process controlled those who are geared towards blame. It led them away from focusing on the human” (Support).

5.8.2.4 Premature termination of the process and learnings for the future

The accident process modification trial was carried out over a period of approximately eight months, as opposed to the twelve months initially planned. The decision to terminate the trial
and implement an accident reporting procedure which allows for punishment to be used was taken by the organisation’s senior leadership team. The reasons for this change ranged from political influence and pressure, differing beliefs on justice, and disparity between societal justice and the type of justice the accident exploration process aspired to achieve.

The decision to terminate the trial was initially triggered by client pressure to do so: “With the accident exploration process, we were trying to implement a new culture programme and our client was not in the same space. Hence, we had to backtrack on the process as the client was not ready for the change” (Organisation Senior Construction). This pressure was attributed to the level of maturity within the client organisation in the area of accident analysis and was compounded by pressure from the organisation’s parent companies to comply with the client’s request: “We decided to rebrand the process due to client maturity. We needed to repackage and rebrand the process due to client pressures. We were then pressured by our parent organisations to do this because of client pressure” (Organisation HSE).

The disparity between societal justice and the type of justice using predominantly restorative mechanisms created some unease towards the process. The example of speeding was used as an example to justify why a process requires the ability to punish mistakes in the workplace. “In our current accident process, we do allow discipline as there is a line. If I’m driving at 75 miles an hour and a policeman stops me, I will be fined. The same is needed in the workplace to maintain control” (Organisation Senior Construction). The client’s safety team’s stance was that anything which was against the law outside of the construction site should be punishable in the workplace. Examples provided included driving over the speed limit of 15mph on site and coming to work under the influence of alcohol (sourced from the HSE just culture workshop attended by the client, 06/04/2018).
Both the client’s HSE team and the organisation’s senior HSE displayed a reluctance to move away from Reason’s culpability tree, even when presented with evidence that its use could damage the organisation’s ability to learn. The client’s team believed that to achieve a fair culture, Reason’s model must be used, as it allows for the punishment of acts that are deemed wilful or reckless in hindsight, whereas the accident exploration process ensured no form of punishment was to be used where a mistake was made (sourced from the HSE just culture workshop attended by the client, 06/04/2018). The organisation’s senior HSE, when implementing the new accident process which replaced the accident exploration process, implemented the Baines Simmons Behavioural Analysis Flowchart, as it permitted punishment where a behaviour can be determined as reckless. The Senior HSE was of the belief that this model was a step away from Reason’s work and towards a more restorative approach, though the aspects of Reason’s model which allowed for the punishment of mistakes were also evident in the Baines Simmons model: “We use the Baines Simmons model in our process. We brought this in to use the same language our client used. The model has moved away from Reason and is more restorative. The model deals with recklessness, which is something we have to deal with” (Organisation HSE).

Though reservations about the process were shown by both the client and the organisation leadership, leadership also highlighted the positive by-products created by the implementation of the process. The promotion of the process as a learning tool rather than a blaming tool was deemed to have helped the participants feel at ease and disclose more information in an honest manner: “The pros of the accident exploration process were that learning was the primary driver behind the investigation which leads to a more open and honest approach from most participants. If they generally believe that the organisation is looking for learning, they feel safe and will participate” (Organisation HSE). A client senior construction representative was surprised at how honest the workforce members were in their
discovery sessions as he was used to reports where the workforce revealed minimal information (sourced from HSE Strategy Workshop with the client, 06/07/2018). Moving away from a blame approach was also viewed as the reason why accident learnings became more system focused and less human focused: “Previously the accident process was very direct: what happened and who is at fault. We now look at a wider sphere of influence and context, which I like. We’ve used that more efficiently to change processes and procedures, as required” (Organisation Senior Construction).

5.9 Discussion

This study was conducted to better understand the impact a system using restorative justice mechanisms has on the individual and future organisational learning following an accident. From the results, there are three clear topics for discussion:

- Using a restorative justice accident process has benefits for the worker and the organisation.

- Accident learning approaches have universal requirements for success:
  - positive treatment of the participant
  - transparency and consistency of the process, and
  - acknowledgement of participants’ experiences with previous accident learning systems.

- A restorative accident process is just as vulnerable to external forces and beliefs as any other process.
5.9.1.1 Using a restorative justice accident process has benefits for the worker and the organisation

The results of our study indicate that in replacing a retributive justice process with a restorative justice process, there are positive benefits for both the workers and the organisation. The removal of punishment and the empowerment of those who suffered the accident were viewed by both the workers and the management as crucial in improving the organisation’s learning culture.

Some of the process modifications had positive implications for both the participants’ wellbeing and their trust in the system. Where the accident process was followed and individuals were informed that no punishment would be used, participants were significantly more willing to share their story with honesty. This was in contrast to the perceptions of the previous process, where individuals were inclined to avoid the process entirely, if possible. This aligns with the views of Leape (1994), Khatri (2009) and Dekker (2012) that punishment stifles learning, and its removal goes a long way in encouraging those involved in accidents to share their story. Also, by empowering those involved, second victim syndrome (Wu, 2000) is minimised and they return to the workforce with a positive view of the organisation, which can also improve productivity (Kaur et al., 2019).

With the workforce more willing to share information and participate in the accident process, the organisation can benefit in several different ways. As mentioned previously, the trust between those involved and the organisation increases when workers recognise that they are being looked after by their management in their time of need. Trust between workforce and management is a key ingredient in the creation of a successful and more productive workplace (Judeh, 2012; Laschinger et al., 2002). This illustrates the influence the accident process can have on an organisation’s culture and the relationship between management and
the workforce. Increased trust is also believed to lead to better solutions to the problems highlighted by the accident report, something which the use of punishment can stifle (Hernandez-Mogollon et al., 2010). Actions created through collaboration between management and the workforce are perceived to be much more valuable than those decided by management only. The actions discussed by the participants in this study were viewed as not only beneficial for future safety, but also for increased efficiency within the production system.

It must be acknowledged that to ensure the accident process is a positive experience, the language used to describe the process is critical (Heraghty, Dekker, & Rae, 2018; Heraghty, Rae, & Dekker, 2020). Many of the negative perceptions of the previous accident process were caused by the language used to describe it. Participants believed that the wording used created the impression that those involved had committed a crime and were on trial, due to the similarity with the language used by law enforcement and the legal system. This aligns with the work of Thibodeau and Boroditsky (2013), which describes the impact language can have on perceptions. The language used in the modified process was deemed an important element in encouraging people to participate. This is important as there remain many within industry who advocate the use of restorative mechanisms to deal with accidents yet inadvertently continue to use both legal and police-style language.

5.9.1.2 Accident learning approaches have universal requirements for success

Regardless of the type of accident process used, there are commonalities which influence all accident processes. Within this study, there were findings which were identical to those highlighted within a study on the impact that retributive justice mechanisms have on an accident process (Heraghty, Rae, & Dekker, 2020).
The standard of communication and its reliability, particularly in terms of information issued immediately following an event, is deemed to have a considerable effect on the treatment of the participants and the actions determined subsequently. Where the swift and factual communication of an event was found to be lacking, those involved were more vulnerable to ill treatment and blame and more likely to leave the process with a negative perception of the system. Poor communication is detrimental to the organisation’s ability to learn, something other authors have also found (Naome et al., 2020; Stemn, Bofinger et al., 2018). One of the organisation’s senior leaders highlighted that stakeholders’ hunger for immediate learnings from serious events can often result in inaccurate information being provided to satisfy this hunger. Poor actions are the result, due to the misleading information provided. This highlights the point that processes which include elements such as initial or interim reports can cause more harm than good, as the people reading them are focused on fixing the issues as quickly as possible and are likely to accept the information as final. A good communication system is not one which attempts to provide all the answers immediately, but one which ensures all involved are kept up to date on the process and the outcomes determined (Pfeiffer, et al., 2013).

It is also worth noting that the treatment of those involved can be unrelated to the type of accident process used by an organisation. The skillset of the supervisor and their ability to compassionately deal with those who have suffered an accident can be the difference between a worker embracing the accident process or actively avoiding it. A supervisor or manager’s reaction to an incident report is known to be interdependent with their team’s willingness to share (Almutary & Lewis, 2012; Clarke, 1998; Hashemi et al., 2012). There are not only safety implications here but also other organisational implications, as workers who are fearful of providing their manager with bad news will likely hide all issues. Crucial areas such as quality, morale and innovation all suffer where a fear of reporting exists (Farson & Keys,
In addition, the pressures and priorities placed on the supervisor by the organisation can lead to the supervisor viewing an accident report as an obstruction to that which they are being ultimately rewarded for—production (see also Prang and Jelsness-Jørgensen, 2014). It is evident that organisations not only need to provide their management with the training to deal with problems positively, but also need to ensure they are being rewarded for doing so. Visible support from all stakeholder senior leaders is crucial in this area to achieve an aligned approach.

A common hindrance faced by an accident process is the previous experience of those involved and how this influences their participation. Workers who have faced or witnessed ill treatment in the past are more difficult to engage, regardless of the type of process (Tabatabaee et al., 2014; Walker et al., 1998). The experience of those overseeing the process can also be influential. Several of the accident cases reviewed involved leaders who reverted to their previous process, negatively impacting those involved and the outcome. It is not sufficient for an organisation to move to a restorative accident process. It is important that any process is designed with acknowledgement of the previous experiences of those involved and where safeguards are in place to prevent experience from unintentionally causing damage to the process and those subject to it.

All of this raises the question—if an accident process is fully transparent from start to finish, management are trained to treat people with compassion, and the language used is more aligned to learning, is there a need to move away from the traditional just culture approach? The answer to this lies in the basics of human instinct, which is to survive. Where a threat exists to a person’s livelihood, regardless of how seldom that threat is acted on by the organisation, a reason exists for those involved in accidents to withhold critical information. Although Reason’s culpability model advanced the pursuit of fairness significantly in the area of accident reporting, those who are subject to it remain at the mercy of the model’s user and
how they interpret terms such as ‘reckless violation’. With hindsight, an action which was acceptable yesterday could be deemed reckless today because it resulted in an accident. It is this uncertainty which leads individuals to remain fearful of the accident process and to reduce their exposure through avoidance and deflection. To achieve the desired learning culture, there is a need to replace retributive justice mechanisms with restorative mechanisms so that there is no longer a fear of job loss following a mistake. People are less willing to be honest where there is an invisible guillotine hanging above their heads and their livelihoods, as shown by many previous studies (Bahadori, 2013; Bayadizi, 2013; Haw et al., 2014). However, it should also be noted that restorative mechanisms cannot be used in isolation. Restorative mechanisms can only achieve success as part of a larger system that includes:

- positive language and framing
- management trained to treat their team in a compassionate manner following an accident, and
- transparency for all involved through all stages of the process.

5.9.1.3 A restorative accident process is just as vulnerable to external forces and beliefs as any other process

Although the modification of the process created many benefits, the accident system remained vulnerable to the same external threats faced by all other processes, all of which carry the potential to jeopardise success.

The non-safety goals associated with the accident process are a significant risk to its success and the ability to learn from mistakes. In recent years, safety has evolved from being a set of targets to prevent injury into something much more. Safety, and its achievement, is today a key element of an organisation’s brand, and is used as part of marketing campaigns to both highlight an organisation’s success and to assist in securing future business. One of the key
reasons for this is that businesses do not want to be seen doing business with organisations which are hurting their people in the pursuit of success, as this would bring bad publicity onto the client and jeopardise their relationship with the public and the regulator—which could risk the sustainability of their business. This is one of the reasons why ‘blood diamonds’ are no longer sold by diamond companies. Serious accidents have become the blood diamonds of industry, as clients and customers do not want to be associated with those who have them for fear of negative publicity. This drives negative behaviour within all levels of the system.

First, on an individual level, employees recognise that participating in safety activities, such as hazard reporting and accident analysis, supports their organisations’ brand as it is something that can be sold upwards. Positive recognition in the area of safety can prove highly beneficial to an individual’s ‘brand’ and thus their career. Those who take an aggressive approach to accident management may be labelled as leaders, as the organisation may use their employees’ approach to show their stakeholders that their people take safety seriously. This can occur even when the aggressive approach taken is damaging to both safety and learning. When an organisation rewards this type of behaviour, it can also lead to individuals using safety to exert power over others under the guise of taking safety seriously.

While organisations reward those who positively support the brand, they also reprimand those who are perceived to have damaged it. Managers who have an association with a serious accident can be viewed by their superiors as a contributor to the reputational damage suffered by the business as a result of the event. This association can prove toxic for the manager’s career aspirations. A fear of this reprimand from their organisation can lead to the manager taking steps to ensure that they cannot be blamed by instead blaming those below them (Heraghty, Rae, & Dekker, 2020) or, as participants alleged within this research, by ignoring any issue raised within a report that could be associated with their department. This highlights the dangers of viewing the behaviour within the accident system in isolation rather
than as a reflection of organisational behaviour. It also emphasises the need for restorative justice mechanisms to become embedded into the organisation’s people management approach rather than being only accident related.

Second, the contractor uses their accident process to show their current and future clients that they are serious about safety and minimise any reputational damage for the client. As the client is entrusting their reputation with the contractor, any risks perceived in the contractor’s system will quickly become a significant concern to the client, as these risks may result in damage to the client’s public reputation. It is in this area that the restorative accident process in this study came undone: the client’s safety team were ideologically opposed to an accident process which moved away from punishment, as they believed that punishment was needed to achieve safety. By raising this issue as a risk to safety, it also became a risk to the client’s brand, which was why they were extremely reluctant for the process to continue. Once the client raised this as a risk to the contractor, the contractor’s leadership team acted quickly to terminate the trial process and create a process which complied with the client’s safety team’s demands. This new process reverted back to a linear-style report which used traditional incident investigation language and punishment. Although the restorative process had been received positively by both senior leadership and the workforce within the contractor’s organisation, the potential damage to the relationship with the client was deemed a greater risk, as it jeopardised the financial position of the business. Aligning the accident process with the views of the client ensured that both safety brands were harmonious.

At all levels of the system, actors behave in a manner that they believe will make their audience happy (Lerner & Tetlock, 1999). The employees’ focus is on their employer, the contractor’s focus is on the client, and the client’s focus is on the public (who are also a major influence on a key stakeholder for all clients—the government). When the ultimate audience is a public who have come to expect punishment for mistakes, as this is what they
are subject to through society’s judicial system, it may have been extremely difficult for the client to support the cessation of punishment for mistakes. In the event of a serious accident, this decision had the potential to come to haunt them, as their audience could accuse them of a disregard for the safety of their people through a lack of accountability for those who deviate from the rules. The perception of fairness is also an influencing factor in this area, as the senior leader may choose to move away from punishment when managing accidents but themselves remain exposed to public prosecution should an event take place. All of this leads us to the necessity of re-evaluating what the accident process is and the purpose it serves.

There have been long-held beliefs within academia that the accident process exists to ensure learning is gained from negative events and that similar occurrences are prevented, while punishment is used in the belief that it will aid future safety. However, the data gathered describes a much more entangled set of purposes. As shown in Figure 5 below, the introduction of an accident process into an organisation is actually a defensive reaction to a legal requirement to learn from accidents.

Both Figure 5 and Figure 6 are system diagrams that show how a variety of systems influence the necessity for the accident process, as well as how these systems impact the selection, implementation and outcomes of the process. Whereas Figure 5 displays what occurs when a retributive accident process is used, Figure 6 shows the use of a restorative accident approach. All boxes which have a red outline communicate the problems within each system and whom they impact. Where boxes have the same colour, this means they are directly affiliated.

Figure 5 shows that the primary purpose of the accident process is to protect the organisation and its management team against the external threats faced. These external threats are threefold and are interlinked. The first threat is that of the legal system and the body that
enforces these legal requirements, the regulator. The second threat is society’s justice system, which remains predominantly retributive in the majority of countries. The third threat is the social understanding of accountability, in which blame is often immersed. All three of these threats influence the structural design of the accident process, the language used to define and communicate this process, the role definitions and the location of authority, and the approach taken to accountability. Alignment between the accident process and the societal systems and beliefs from which the threat of blame and punishment have emerged is important, as it leaves the organisation less exposed to legal prosecution by showing they have found the problem (the person), and less exposed to accusations of not taking safety seriously (because there is no accountability) and to reputational damage. The benefits to alignment with society’s system also extend to the organisation’s relationship with its clients, who may not face equivalent legal or justice system threats but can often face a similar threat of blame from the public. The ability to punish those involved in accidents is not included in the process design because managers believe it helps achieve future safety or is a way for them to command and control (although these beliefs can exist). Instead, the mechanism exists as a means for management to protect themselves against the societal approach to accountability. The accident process provides management with the ability to discharge their own accountability through the creation of new accountabilities for the workers. Whenever there is the potential for external stakeholders to seek to hold those responsible accountable following an event, the process ensures accountability resides with the individual. As the levels at which external threats exist increase, so too does the potential for punishment to be issued to the individual deemed responsible. With this system, the organisation and the client are reasonably well protected from these external threats, but less so the individual, particularly those who are not in positions of authority. All of this has a knock-on effect for the organisation’s learning ability. The threat of blame and punishment, which ultimately
emerged from societal systems and beliefs, leads to an accident process which becomes rife with defensive practitioners whose main goal is to defend themselves against the threat of punishment and blame, and to survive, rather than to support any accident learning. The clients defend themselves through their contract with their contractor and through the contractor’s accident process. The contractor’s management team protect themselves by using their control of the accident process, as well as the information they provide as part of an event, to ensure that accountability ultimately resides with the individuals doing the work. The workers involved in an event attempt to protect themselves by creating a narrative which is least likely to result in their punishment. The end result is that the learning gained is minimal and the damage to organisational trust is significant.
In recent years, there has been a growing call for organisations to adopt a restorative approach to accident analysis. The belief is that by removing the threat of blame and punishment from the accident process, the organisation’s ability to learn from its mistakes...
increases. As shown in Figure 6, this is indeed the case. The key difference between Figure 5 and Figure 6 is the transfer of the process’s emergent problems from the worker to the organisation. Within Figure 5, the organisation, their management team and their client are all well protected from external threats by the accident process, as it is aligned with the societal system. It is both the worker and organisational learning which suffer in this instance. However, as shown by Figure 6, the reverse occurs when the accident process moves from retributive to restorative. When this takes place, the worker and organisational learning benefit from this type of accident process but the organisation, their management and their client become vulnerable to the societal system due to a misalignment between it and the restorative accident process. As the threats of blame and punishment are not created or controlled by the organisation, they cannot be extinguished by simply changing the accident process. Instead, there is a shift in those who face the most risk of blame and punishment: the worker is somewhat protected by the process, but the organisation and its client remain exposed. This creates instability in the process and increases the risk of its termination because, by removing punishment, management are no longer able to protect themselves, their organisation or the client from external blame. Furthermore, the increased risk to the client puts their relationship with the contractor at risk as well as the likelihood of any future contracts between the two. This dilemma has similarities to the argument in the US regarding gun control. Most of those who own guns have no desire to shoot anybody. The main reason they want to keep their guns is so that they have the ability to defend themselves should they ever face a threat. In a similar vein, management’s wish to have the ability to punish included in the accident process is not because they want to punish people, but so they have a weapon they can use to defend themselves when faced with external threats. Like the gun, they may never use it, but are much more comfortable when they know it is there should they need it. This raises concerns regarding the ability to implement a restorative justice approach within
an organisation that exists within a society where retributive justice is the norm. Although a restorative approach within an organisation has the ability to shield individuals from blame and punishment to a certain extent, it cannot remove the possibility of blame and punishment occurring, because the ultimate threat exists far beyond their control.
Figure 6: Accident process using restorative justice

- **Societal Retributive Justice System**
  - Influences legal system and language
  - Infused in the justice system
  - Influences social understanding of accountability

- **Social understanding of accountability**
  - Requires organizations to learn from accidents
  - Provides the threat of blame

- **Restorative Org. Accident Process Design**
  - Accountability approach: Misalignment with justice system
  - Misalignment with social understanding of accountability

- **Implementation of the Accident Process**
  - Neural language used: Increases participation and system-focused decision making
  - Mismatch: Client’s needs, which risks contract

- **Client**
  - Clientless protected from blame by process
  - Process no longer includes ability to punish
  - Relationship deteriorates due to misalignment in the approach to accidents

- **Worker**
  - Increased honesty and engagement as protected from blame
  - Remains exposed to external blame

- **Org. Management**
  - Increased mutual trust

- **Increased honesty may continue as societal threat remains**

- **Misalignments to honesty may continue as societal threat remains**
The forceful requirement for the contractor to adjust their accident process to ensure alignment with the views of their client also raised some important questions—for example, what should the role of the client be? Traditionally, clients employed contractors because they themselves lacked the subject matter expertise to self-deliver and they required the services of an organisation which had this capability. The client’s role would be to ensure the contractor was adhering to the contractor’s own system and any contractual requirements. However, in recent years, the role of the client has expanded to the point where they have become the ultimate authority and often dictate how work is to be carried out in a prescriptive manner. This is understandable given the reputational risk to which they are exposed, but it does also raise a concern: have the clients today determined themselves as the ultimate decisionmakers based on contractual power rather than knowledge and experience? Power-based decision making in place of decisions made by those with the most knowledge and experience can increase risk exposure and cause damage to relationships and trust. In future, clients working in partnership with their contractors, as opposed to a master–servant relationship, may support the pursuit of their goals in a manner more beneficial to safety, as this approach maximises the use of the resources at their disposal through empowerment and engagement.

An organisation’s concept of success can have ramifications for the accident process. The measurement of success through outcomes alone is shown to generate negative behaviour towards safety goals and stifle the management of safety issues, as also previously seen in the UK’s NHS (Weber et al., 2011). Some of the participants discussed how the organisation’s fixation on the work program and target dates led to the premature closure of the accident analysis and a negative reaction to accident reports. In a similar manner to the safety brand concept, people recognise that the behaviour required is that which generates a positive response from their employer and ultimately helps cement job security. Where outcomes such
as target dates are the sole measurement of success, it is highly likely that the behaviours needed to achieve these outcomes will fall short of acceptable. The focus needs to move towards measuring and rewarding the behaviours which positively influence a learning culture and viewing outcomes, such as milestone dates, as by-products of these behaviours rather than as the measurement. Key performance indicators need to be based on behaviours and employee perceptions, rather than activity outcomes.

The knowledge and skillset of the safety professional facilitating the accident analysis can have far reaching consequences for the accident process and any potential learning. Concerns were highlighted by several participants regarding the abilities of some of the safety professionals and their understanding of the process. These issues impacted both the perception of the process and, consequently, the ability for the organisation to learn. Many of the safety professionals spoken to showed a lack of knowledge regarding the latest safety science, with some remaining anchored to theories from which the world of safety science has moved on, such as human error as a cause and Reason’s culpability tree (Reason, 1997). This finding aligns with that of Provan (2018), in that there are substantial deficiencies in the training and development of the safety profession across industry, something which has a negative effect on the standard of science-based advice provided to organisations.

5.9.1.4 Strengths and limitations of this paper’s approach

This study used an in-depth case study design, with the researcher at the heart of the case study. The strength of this type of analysis is that it captures and describes the experience of the accident process through engaging with a variety of individuals operating at different levels and with varied levels of exposure. Within embedded research projects, the level of trust between the researcher and the participants, particularly those in more senior positions, can often be higher than with other methods, as the researcher is viewed as part of the team.
There is also a greater potential for the research to transition to practice within the organisation post-study, as there is more ownership of the results given that they were created internally.

The limitation of any case study is that it is hard to determine which results are generalisable and which can be attributed to the specific circumstances of the case study. This is not an inherent weakness but means that further similar work is required to establish commonalities and differences. The data analysed is also of a qualitative kind which may create scope for observer bias as the researcher’s own theories and opinions could influence the data chosen for analysis and its meaning.

5.9.1.5 Implications for practice

The results show that the use of restorative justice mechanisms within the accident process can create significant benefits for both the individuals involved and the organisation. Those who suffer the accident find this type of process empowering, while the learning for the organisation is perceived to be greater, both of which will likely have a positive impact on the organisation’s commercial performance.

It is important to acknowledge that the restorative approach required to help achieve organisational learning is much more than simply replacing mechanisms that are retributive with mechanisms that are restorative. The language used, the training provided to managers in the treatment of their people, the acknowledgement of past experiences and the transparency of the process are all key ingredients in the success of the approach.

The study also raises the issue of the threats faced when implementing a restorative style approach, or any process for that matter. In addition to ensuring the key fundamentals are sufficient, there are also broader issues which require addressing. First, it is important to recognise that workplace behaviour often reflects what workers are being rewarded for.
Evolving from outcome-focused rewards to primarily behaviour-focused rewards within organisations can help remove many of the negative behaviours identified within this research. Second, it must be acknowledged that where safety also serves organisational brand purposes, additional risks may emerge which can be detrimental to the pursuit of a learning culture. Third, it would be beneficial for clients to move towards a partnership-based model with their contractors, as this would help maximise the use of the resources at their disposal through empowerment and may help improve the use of evidence-based decision making.

Fourth, the ideological clashes with societal views need to be taken into consideration when attempting to influence the achievement of fairness in an organisation. Where the approach within society and the organisation is inconsistent, a perception of unfairness can emerge due to a lack of consistency for those subject to both systems. Below is a table showing an example of how each of these key areas could be enacted.

**Table 8: Recommendation Implementation Examples**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Implementation example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisations to transition from outcome-focused rewards to behaviour-focused</td>
<td>Rather than measuring success based on achievements, such as the meeting or exceeding of a deadline date, measure and reward the behaviours which have been proven to create a workplace environment that enables the desired outcomes, such as workforce empowerment, curiosity, collaboration and prospective accountability.</td>
</tr>
<tr>
<td>rewards.</td>
<td></td>
</tr>
<tr>
<td>Identify all additional risks to workplace safety created by the use of safety</td>
<td>When reviewing organisational risks, include the risks associated with safety being misused for non-safety goals and ensure appropriate actions are determined and monitored by the organisation’s leadership team.</td>
</tr>
<tr>
<td>and ensure these risks are continually monitored and managed.</td>
<td></td>
</tr>
</tbody>
</table>
**Recommendation**

Clients to move towards a partnership-based model with their contractors to help maximise the use of the resources at their disposal.

**Implementation example**

When creating contracts for use with the supply chain, ensure they are written in a way whereby the supply chain is brought into the process as a collaborative partner (as opposed to the traditional master/servant approach) and are empowered to take ownership of the areas where they are the subject matter experts—e.g., some construction projects now operate in a model where the construction contractor and the client operate within a partnership model where employees from both organisations work within one delivery team.

Ensure any potential ideological clash between the organisation’s justice system and the societal justice system it operates within are understood and all associated risks are managed.

**Implementation example**

Prior to the implementation of any justice system within an organisation, determine whether the approach conflicts with that used by that country or region’s system and iron out any potential concerns with the workforce.

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**5.10 Conclusion**

The key question this paper set out to answer was: ‘How does a shift in the accident analysis process impact a learning culture?’

The findings of this paper show that the replacement of a linear retributive accident model with one which is non-linear and restorative creates a range of implications for the organisation’s ability to learn, many of which are positive. Many of the areas highlighted within academia as being key to organisational learning, such as trust, empowerment and engagement, were shown to improve following the process modification. The learnings from this paper serve as evidence of the benefits of a restorative approach to accidents and the importance of language in the process. This paper also provides industry with a deeper understanding of the nuances involved when implementing any accident process and the
factors that need considering to ensure that the process enhances, rather than hinders, the organisation’s learning culture.
Chapter 6: CONCLUSION

6.1 Achievement of research aim

The primary aim of this research was to understand whether a change in an organisation’s accident process could influence its ability to learn. This aim was achieved by displaying that, following the modification of the accident process from a retributive approach to a restorative one, many key outcomes which have previously been shown to benefit learning emerged.

- Participants were less fearful and were willing to be more honest than previously,
- Those involved were much more engaged with the process and determining of actions,
- Management believed the actions became more useful and relevant once the workers became more engaged with the process and the actions,
- A change in the language was also shown to reduce the level of fear towards the process,
- The modification meant that the organisation’s justice system and the societal system became misaligned which created fear within the management team and negatively impacted the process.

The accident process has been for some time a core element in the management of safety within organisations. The key objective of the accident analysis process is almost always defined as the need to learn and to prevent the reoccurrence of similar negative events. The research aim emerged from the need to understand whether different approaches to accident analysis impact an organisation’s learning culture in different ways. The hypothesis prior to commencing the research was that the replacement of an accident process which used retributive justice mechanisms with one which used restorative mechanisms would increase
the level of trust within the organisation and the ability to learn. To dig further into this topic, four separate research projects were carried out. The main sub-questions for each of these projects were as follows:

- What is the relationship between the degree of retribution and the willingness to share safety-critical information?
- What impact, if any, does language have on decision making following an accident?
- What are the unintentional by-products of an accident process which uses restorative justice mechanisms?
- How do opinions about the achievement of justice and the approach used vary between different levels of the organisation?
- Is there a distinct difference in the opinions on the justice system between those who have been directly exposed to the system to those who have not?

The findings of this study are further explained through each of the sub-questions under the primary research question.

**SQ1: What is the relationship between the degree of retribution and the willingness to share safety-critical information?**

Chapters 2, 3 and 4 report both the results found in previous literature and those which emerged from this study. The key findings were:

1. Where the potential to be punished existed as a result of suffering an accident, both the workforce and the management team believed accidents were less likely to be reported and those involved were less likely to be honest regarding what had occurred. This impacts an organisation’s ability to learn from the issues which reside in their system.
2. It was not only disciplinary action that was viewed as retributive, but also other aspects of the accident process. Drug and alcohol testing and the standing down of a worker following an event were both viewed as forms of retribution which influenced both the level of participation of the individual and future reporting.

3. The replacement of retributive justice mechanisms with restorative mechanisms had a positive impact on both the willingness of the workforce to report an accident and their level of participation in the accident process.

4. There was a significant difference between those exposed to an accident process which used retributive justice mechanisms and those exposed to restorative mechanisms in regard to future reporting. Most of those exposed to the former were much less likely to report a future event because of their treatment while those exposed to the latter were more than happy to report based on their experience.

SQ2: What impact, if any, does language have on decision making following an accident?

Chapters 3 and 4 reported the results of the case studies carried out on two different accident processes, while Chapter 5 provided the learnings from the accident report interpretation survey. The key findings were:

1. Individuals are less likely to share information where the process includes language viewed as ‘police-style’, as it creates the perception that they are the focus of the analysis and their livelihood may be at risk. (See Table 6 which shows the ‘police style’ language of the old accident process and the more neutral language used in the new process)

2. The corrective actions determined as part of the accident process are heavily influenced by both the report’s analysis style and the type of language used.
Reductionist accident analyses coupled with ‘police-style’ language increases the likelihood of human-centred actions and blame.

3. Using language deemed more neutral and focused on learning encourages more honesty and transparency. It also assists with a more solution-focused and collaborative approach within the team following an accident.

4. Safety professionals are less likely than operational personnel to view the language used as having any impact on the process itself and the outcomes determined.

SQ3: What are the unintentional by-products of an accident process which uses restorative justice mechanisms?

Chapter 4 reported the results of a study of the by-products of an accident system which uses restorative justice mechanisms. The key findings were:

1. The use of an accident system which uses restorative justice mechanisms can create friction between the organisation and its customers in situations where the customer expects to see punishment used.

2. A perception of injustice can emerge within the organisation’s senior leaders when using restorative justice mechanisms in locations where the societal justice system continues to use punishment for those who are involved or who are deemed to have influenced an accident. Seeing a worker be absolved of punishment for an accident they themselves could be prosecuted for by the regulator can lead to a sense of unfairness.
SQ4: How do the opinions of different levels of the organisation vary on the achievement of justice and the approach utilised?

Chapters 3 and 4 reported the results of two different studies where the opinions of various levels of the organisation were sought in regard to the approach to accident analysis and its ability to achieve fairness. The key findings were:

1. Personnel in management positions are much more likely than the workers to believe the use of punishment following an accident is both fair and beneficial.

2. The views of the safety professional are more aligned with the views of management than the workforce on the benefits of punishment to deal with the mistakes unearthed during the accident analysis process.

3. While management view the search for rule compliance as an integral aspect of an organisation’s accident analysis approach, the workers see this as a distraction from risk management, as the rules do not often align with the risks.

4. Although all the workers and most of the management team were in agreement about the benefits of restorative justice mechanisms, some leaders and the client’s safety team perceived this approach to justice as an accountability-free approach due to the lack of disciplinary action involved.

SQ5: Is there a distinct difference in the opinions on the justice system between those who have been directly exposed to the system and those who have not?

As with SQ4, Chapters 3 and 4 captured the opinions of individuals at different levels of the organisation, including those who are both directly exposed and those who are not. The key findings were:

1. It was agreed at all levels of the organisation that the use of suspension following an accident was both harmful to the worker and to the organisation.
2. There was a distinct difference of opinion on the topic of punishment and its benefits. Those less likely to suffer punishment following an accident, such as senior leaders and safety professionals, were more inclined to see punishment as beneficial, while those more likely to be exposed to the disciplinary process, such as the workers themselves, believed punishment to be unfair and damaging to a learning culture and future safety.

3. The role least likely to be exposed to the accident process as a participant, the safety professional, was also the most likely to view the language used within the process as non-consequential.

4. All personnel interviewed, whether directly exposed to the process or not, viewed a restorative approach to accidents as much more beneficial to learning than one which is primarily retributive.

The conclusion from this research is that the accident process and the approach taken to analyse an accident has a significant impact on the organisation’s ability to learn. The language used as part of the process, the style of accident analysis used, and the justice mechanisms attached to the process were all shown to influence learning.

As a practical attempt to sustainably reform the accident process within the target organisation, and to demonstrate the merits of that reform, this project was a failure. Fortunately, answering the research questions was not dependent on practical success.

6.2 Scientific contribution

This thesis makes four significant theoretical, empirical, methodological and practical contributions to scientific literature in the areas of accident analysis and just culture, including:
1. creating a bridge between theory of language and decision making and the theory of just culture
2. providing qualified support for some of the claimed benefits of a restorative approach
3. demonstrating how an ethnographic approach can be used to study accident analysis, and
4. discovering the challenges of implementing a change to the accident analysis process.

6.2.1 The accident analysis approach and the language used

This thesis and its findings have created a bridge between two previously unconnected ideas:

- the theory of how embedded language influences decision making (Thibodeau and Boroditsky, 2011), and
- the theory of just culture in accident analysis (Dekker, 2012; Reason, 1997).

Prior to this study, many of the authors who discussed just culture, such as Dekker and Reason, paid little regard to the importance of language within the process. Much of their work uses language deemed as ‘police style’ by the participants of this study e.g., incident investigations. The works of Thibodeau and Boroditsky (2011) showed how that the language used to describe something can have a significant effect on the subsequent decisions made by the reader or listener. Chapter 3 of this thesis built upon Thibodeau and Boroditsky’s work and extended to the area of accident analysis where it was shown that how an accident report is written affect the focus of the subsequent actions decided and whether they are human-focussed, or system focussed. Chapters 4 and 5 delve beyond the accident report and show that the language within the process itself can cause fear and bias within those involved, negatively impacting the ability to learn from the event, while an adjustment to the language used can help suppress these issues. This thesis shows that achieving a just culture through the accident analysis process cannot occur without also ensuring that both the language used
within the process and the style of the accident analysis process selected are aligned with systems thinking and learning. By recognising that a just culture is dependent on the language and framing used within the accident process, a bridge has now been created between these theories that can help influence future work in this area.

This contribution also extends the theory of second victims (Dekker, 2012; Wu, 2000) by showing that the language used in both accident processes and their subsequent reports can have a detrimental impact on the individuals involved and how they are treated.

The studies reported in Chapters 3, 4 and 5 showed the power language wields as part of the accident process and how the language used can dictate the level of learning gained. These chapters also provide new knowledge on the lack of understanding safety professionals display regarding the effects their accident approach have on those exposed to it. The findings of this thesis highlight the need for industry to recognise the impact language and framing have on their ability to continuously improve.

6.2.2 The benefits of a restorative approach to accidents

Several authors (Dekker, 2012; McCall & Pruchnicki, 2017) have made claims regarding the benefits of approaching accidents in a restorative manner. This thesis has applied and extended the theory of restorative justice as applied to workplace accidents by providing empirical support for some of the theorised benefits. Chapter 5 shows that a restorative approach to accidents can improve the workforce’s perceptions of the accident process and their willingness to report and engage. The level of mutual trust and learning within the organisations are also believed to increase when this style of accident analysis is used.

However, while there were many benefits found related to the introduction of a restorative accident process, there were also some limitations. Although the approach of accountability was modified, this change provided no noticeable benefits to the completion of safety-related
actions. It was also shown that even with the changes to the accident process, the challenges faced during implementation mirrored those which were found to affect the previous retributive accident process.

6.2.3 The benefits of an ethnographic approach when studying accident analysis

This thesis makes a methodological contribution to the study of accident analysis. Much of the research on the topic of accident analysis relies heavily on formal accident reports or provides normative accounts of how to do or not do accident analysis. Section 2.6.5 of this thesis discusses how ethnographic approaches have been used for safety in the past but are only beginning to touch the world of accident analysis. This thesis demonstrates the value of an ethnographic approach when studying accident analysis through the provision of a rich understanding of the lived experience of both the participants and those who oversee the process. The approach allows the reader to step inside the world of accident analysis and truly appreciate the complexity of both the process and the environment in which it resides. It is only through the stories of those involved that the reader can fully apprehend not only what has happened when an accident occurs, but the true purpose of the accident process.

6.2.4 Implementing a change to the accident process

This thesis provides practical contribution to both research and industry by showing the difficulties faced when attempting to make a change to the accident process. These challenges included:

- Implementing a restorative approach to accidents where is not aligned with the societal justice system,

- The organisation using outcome-focussed rewards for individuals which then leads to undesirable behaviour,
• Safety used as part of the organisational brand and, as a consequence, individuals making decisions which are beneficial to their brand and that of the organisations but not to safety outcomes.

There is much research available which discusses the merits of different accident approaches but there is very little in the way of highlighting the key challenges which must be overcome to achieve an accident process which supports learning. The findings of this research provide organisations and safety professionals with a strong foundation on which they can launch a successful restorative just culture accident approach within their workplace.

6.3 Practical implications

This thesis provides a range of practical implications and considerations in the areas of accident analysis and just culture. The most important of these are:

1. Safety professionals and their associated organisations need to become more aligned with the latest safety science so that they can continuously maximise organisational learning and minimise any negative impact on their people.

2. Future accident analysis models put forward by the world of academia must incorporate and communicate the importance of language and framing in regard to both the process of accident analysis facilitation and the subsequent accident report.

3. A just culture is more than the justice approach used. Organisations should ensure that their accident analysis process recognises and includes processes to ensure that:

   a. the initial treatment of actors involved in accidents is positive

   b. there is an understanding of the influence a transparent process has on learning and future participation
c. tactics are employed to manage the influence that past experiences have on the way in which individuals approach an accident analysis
d. it is understood that non-safety agendas often influence the accident process and controls are in place to minimise any negative impacts on learning.

4. The societal system within which an organisation resides can influence individuals’ expectations of justice and their perceptions of fairness. Before implementing a just culture approach, early engagement with all the key stakeholders must occur to iron out any potential concerns.

5. Organisations should re-evaluate their measurements of success so that the scientifically proven ingredients for success, such as empowerment, curiosity, collaboration and prospective accountability are rewarded, rather than only outcomes being rewarded.

6. The risks associated with the use of safety as a brand need to be recognised by organisations and controls put in place to minimise the misuse of safety for non-safety goals.

7. Organisations should transition to a system where their supply chain is treated as a collaborative partner as opposed to the traditional master–servant relationship, to encourage empowerment and collaboration.

6.4 Limitations

The ethnographic approach to this research necessarily involved a trade-off between impartiality and access. My findings were shaped by what people were willing to tell me, and how I interpreted that information. It should be accepted that other researchers, in other organisations, with other methods, might find different results. Ethnographic results are influenced by a range of factors including the researcher’s own knowledge and experience as
well as their relationship with participants. For example, the questions in this thesis were shaped not only by previous research, but by my own experience as a safety professional. Prior to commencing this research, I was aware of the differing opinions on justice approaches and their merits within my own organisation and this no doubt influenced the creation of this thesis’s questions. It would be wrong to claim that no form bias existed during my interviews with participants, but this potential risk was more than compensated for with the trusting relationship which existed between myself and the organisation. This relationship allowed me access to both documents and people an outside researcher would have struggled to gain, given the sensitive nature of the study. It also meant I had a deep understanding of both the project itself and the how this type of project operates, allowing me to carry out this study in a more efficient and effective manner than an outside researcher could.

6.5 Future work

There would be a benefit to future safety science in expanding the exploration of the central research question of this thesis and researching additional questions that emerged both from the literature review and the research findings. The following section outlines possible short-term, medium-term and long-term research focuses.

6.5.1 Short-term research

The following two proposed research questions (PRQ) would expand our understanding and application of the research findings presented in this thesis in the shorter term:

PRQ1: Can a shift in the accident analysis process impact the learning culture of organisations outside of the construction industry?

Context is very important for safety research. Given that this research was carried out within a single organisation operation within a specific industry, it is difficult to determine how
much of a role the industry and local environment played in generating the findings. Through an extension of this study to various organisations operating in different industries, the ability to generalise the findings of this study could be answered more conclusively. This question would be explored using the same intervention and ethnographic methods used for this study to ensure a consistent approach was maintained.

**PRQ2: How does word choice and framing affect everyday decision making and the associated safety outcomes?**

The findings of Chapter 3 displayed the impact that word choice and framing within accident reports have on the reader of the report and their subsequent decision making. The language and framing used was found to have been influenced by a number of factors, including the legal system and the accident analysis model. The accident process itself is only a small (though highly influential) component of a much larger safety system, with many of the other elements used more frequently by the organisation and its workforce. Determining the impact that the language and framing within these other elements have on decision making and subsequent safety outcomes would provide organisations and the safety profession with a greater understanding of the gravity of the problem faced. An ethnographic approach should be taken to this question. Rather than focusing on accidents and the resulting reports, this study should be explored through the analysis of everyday work. Through the use of a case study approach of different work groups and their associated safety processes, an enhanced comprehension would be gained as to whether a revamped accident process would be enough to improve engagement and learning or whether there is a need to modify the entire safety system to capture and manage this risk.
6.5.2 Medium-term research

The following four proposed research questions (PRQ) would expand our understanding and application of the research findings presented in this thesis over the medium-term range.

PRQ3: How does the approach of the safety professional impact the achievement of safety within an organisation?

Chapter 5 of this thesis suggests that the capabilities of the safety professional impact the quality of the accident analysis and the treatment of those involved. There is a great deal of information within safety science to assist organisations in creating a culture which supports positive safety outcomes, including studies on the role of the safety professional within organisations. However, there is little to show whether there is a direct link between the capability and approach of an organisation’s safety function and the type of culture which exists within the workplace they support. Do organisations where safety professionals are more aligned with safety science achieve better safety outcomes than organisations where this is not the case? This project should be based across a range of industries where safety professionals exist within the organisational structure. The research design of this study should focus on understanding the culture within each workplace and how it affects safety. The elements scientifically shown to create a culture which supports positive safety outcomes should be used as a baseline. Once each workplace culture has been measured against the baseline, the level of alignment between safety science and the safety professionals associated with each workplace should be assessed.

PRQ4: How does the judicial approach in different countries influence the approach taken to accident analysis within organisations?

Within this study, it was shown that the national judicial approach had a significant influence on the organisation’s accident process and decision making involved. The research
highlighted how the judicial approach and its associated legal system influenced both the need for an accident process and its approach to accountability. This question aims to evaluate the level of alignment between societal accountability beliefs and the accident processes of specific organisations who operate within this society. This project would need to occur across a range of countries, each with different approaches to accountability. The learnings from this study would further industry’s knowledge in this area.

**PRQ5: If an organisation’s primary measures of success were based on desired behaviours rather than outcomes, what impact would this have on safety?**

This thesis suggests that rewarding individuals and the collective for achieving production targets can be detrimental to safety. Also spoken of in this thesis is the fact that all employees behave in a manner they believe will support their employment and ultimately, their survival as workers. There have been a number of examples within the industry, such as the four-hour emergency room target set by the NHS and the Highways England pot-hole target, which showed that rewarding teams for reaching targets, or desired outcomes, can have a negative impact on both safety and efficiency. There is also significant existing research which discusses both the individual and team behaviours needed to support positive safety outcomes. This question should be explored through an action-based approach. An organisation which rewards their people primarily for outcomes should be chosen and a workplace-wide safety climate survey should be conducted to create a baseline before the organisation’s measurements of success are adjusted to become behaviour oriented. These behaviours should be based on those which are scientifically proven to support successful production and safety outcomes. A post-study survey should also be carried out to determine whether the system adjustment has any impact on employees’ perceptions. While the trial is occurring, semi-structured interviews should be carried out with sample individuals at
different levels of the organisation to gain a deeper understanding of the impact of the change.

**PRQ6: Do different types of contracts and relationship arrangements between client and contractor have the ability to influence different safety outcomes?**

It is often suggested within the operational world that the type of contract which exists between the client and the contractor influences the standard of safety on a construction site. However, there is little evidence to support this claim. This thesis, in Chapter 5, discusses the influence the client has on the safety approach on site and how their influence can impact safety outcomes. To expand on this finding, research is required across a range of projects, each with a different type of contract between the client and the principle contractor. This study should be carried out using a large-scale survey across a vast number of construction sites, using a consistent number of sites for each contract, to gather perceptions of safety. This will allow the research team to compare the results for each contract and determine whether there are noticeable variations. Subsequent to the survey, sample interviews should be carried out with employees on each site to create a rich narrative around the findings.

### 6.5.3 Long-term research

The following proposed research question (PRQ) would expand our understanding and application of the research findings presented in this thesis over the longer term.

**PQ7: Can the replacement of a root cause analysis accident process with a systems-based approach improve safety outcomes?**

The literature review of this project discusses the need for organisations to evolve their accident processes from traditional, root cause analysis style, to a more systems-based approach. Though the language focused paper touches on this area, the main research
intervention of this project did not use an industry recognised system-based accident model when modifying the accident process. This study requires an intervention within an organisation, or organisations, where the accident model used is root cause analysis based. This process would be modified to become one which is based on a recognised system-based model. The analysis of the change, if any, would be carried out using the methods initially determined for the study discussed in Chapter 5.

6.6 Final conclusion

This thesis set out to answer the following question: “How does a shift in the accident analysis process impact a learning culture?”

The key findings of this project show that a shift in the accident analysis process does indeed impact an organisation’s learning culture. Following the modification of the accident process from retributive based to restorative based, in addition to the language used, many positive benefits to learning emerged. Participants felt much more engaged with the process and believed they could be more honest with their disclosure due to a lack of fear, while management saw a noticeable difference in the amount of information shared and the quality of the actions created following the modification. These improvements were not only believed to have positively impacted safety and accident learning, but organisational justice also.

This thesis and the four different studies included also provide a compelling narrative of the complex world of accident analysis and the challenges faced by any organisation seeking to implement an accident process which aspires to generate learning. It shines a light on society’s approach to accountability and how it not only influences industry’s approach to accident analysis, but the very reason an accident process is so desirable to an organisation. The key findings from this thesis provide organisations with a solid platform on which a learning-oriented accident analysis can be built.
REFERENCES


https://doi.org/10.1191/0969733004ne739oa


https://doi.org/10.1037/xge0000018


http://dx.doi.org/10.1016/j.ssci.2016.03.012


https://doi.org/10.1177/1462474022228464


DeVille, K., (2002). The role of litigation in human research accountability. *Accountability in Research: Policies and Quality Assurance*, 9(1), 17–43. [https://doi.org/10.1080/08989620210355](https://doi.org/10.1080/08989620210355)


http://dx.doi.org/10.1136/qhc.12.suppl_2.ii46.


http://dx.doi.org/10.2139/ssrn.1551627


https://doi.org/10.3923/ibm.2012.264.269


https://journals.lww.com/journalpatientsafety/Abstract/9000/A_Transactional_Second_Victim_Model_Experiences.99393.aspx


http://dx.doi.org/10.1027/2192-0923/a000068


https://assets.publishing.service.gov.uk/media/54c1704ce5274a15b6000025/FormalInvestigation_HeraldofFreeEnterprise-MSA1894.pdf


https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0016782


https://doi.org/10.1056/NEJMs0903885


https://doi.org/10.1080/00140139.2015.1015622


https://doi.org/10.1016/j.annemergmed.2010.08.013


APPENDICES

APPENDIX A: DISCOVERY SESSION TEMPLATE

Safety Justice System Discovery Session
INFORMATION SHEET

Senior Investigator
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+61(0)737359764
d.rae@griffith.edu.au

Co-Investigator
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Research Team
Derek Heraghty
School of Humanities, Languages and Social Sciences
+44(0)7387233701
Derek.heraghty@griffith.edu.au

Why is the research being conducted?

The research is being conducted to help understand the impact the introduction of a restorative justice system in place of a retributive system has on the achievement of a learning culture in the workplace.

What you will be asked to do

You will be asked to answer questions related to hazard reporting, accident reporting, safety justice and trust and each discovery session should last no longer than 60 minutes.
The basis by which participants will be selected or screened

Participants have been selected based on 2 key criteria:

1. Their specific role on site
   - Operator
   - Supervisor
   - Project Support
   - Manager
   - Senior Leader

2. Their involvement in an accident on site.

There will be 2 separate discussion types within this project;

- The discovery sessions with personnel selected solely because of their role,
- Discovery sessions with those who have recently been involved in an accident.

The sample group has been selected using the following methods:

**Safety Justice Discovery Session – Post-Accident**

Potential participants were selected based on their role and their involvement in a recent Class 2 or higher accident.

The expected benefits of the research

It is reasonable to expect that the results from our research will provide industry with a greater understanding of the impact which occurs when retributive justice mechanisms are replaced with restorative mechanisms in assisting the management of safety risk.

Risks to you

The likelihood of you being at risk is very low.

The key risks faced by you are the unauthorised release of your session recording with potential for social and professional damage and the disclosure of participation in illegal activities.

The controls in place to manage these risks are:

- Your recording will be confidential with only the research team receiving access to it,
• The recording will be erased immediately after transcription and we will ensure that any names or personal details that could identify the participant are removed from the transcript,

• The data available within our published research will not disclose any of your personal information and you will be un-identifiable by members of the public,

• All participants are requested prior to commencing their discovery session to refrain from disclosing any participation they have had in the past involving illegal activities.

Your participation is voluntary

There is no requirement for you to participate in this research should you be unwilling to take part.

You are free to withdraw from the study at any time.

Questions / further information

Should you have any further questions, please contact one of the research team listed above.

The ethical conduct of this research

Griffith University conducts research in accordance with the National Statement on Ethical Conduct in Human Research. If potential participants have any concerns or complaints about the ethical conduct of the research project they should contact the Manager, Research Ethics on +61 3735 4375 or research-ethics@griffith.edu.au.

This research has been approved by Griffith University Ethics Committee and has been provided the ethics number of GU ref no: 2017/850.

Feedback to you

The results of our research will be available on the conclusion of our research and the creation of our publication.

Should you wish to receive a copy of this publication, please provide the research team with your
email details.

**Potential Conflict of Interest**

The researcher, Derek Heraghty, is a member of the Project Safety Team. Derek’s role within this specific research project is that solely of a researcher and any information shared will be treated in line with the Griffith University Ethics Committee requirements.

**Privacy Statement – non-disclosure**

The conduct of this research involves the collection, access and/or use of your identified personal information. The information collected is confidential and will not be disclosed to third parties without your consent, except to meet government, legal or other regulatory authority requirements.

A de-identified copy of this data may be used for other research purposes including publishing openly (e.g. in an open access repository).

However, your anonymity will always be safeguarded. For further information, consult the University’s Privacy Plan at [http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan](http://www.griffith.edu.au/about-griffith/plans-publications/griffith-university-privacy-plan) or telephone +44 (0)7 3735 4375.”
Safety Justice System Discovery Session

CONSENT FORM

By signing below, I confirm that I have read and understood the information package and in particular:

- I understand that my involvement in this research will include the answering of questions related to the site’s safety justice system and how it impacts the reporting on site;
- I understand that the research will include audio recording of my participation;
- I have had any questions answered to my satisfaction;
- I understand the risks involved;
- I will not disclose involvement in any illegal activity during the discovery session;
- I understand that there will be no direct benefit to me from my participation in this research;
- I understand that my participation in this research is voluntary;
- I understand that if I have any additional questions, I can contact the research team;
- I understand that I am free to withdraw at any time, without explanation or penalty;
- I understand that my name and other personal information that could identify me will be removed in publications or presentations resulting from this research;
- I understand that I can contact the Manager, Research Ethics, at Griffith University Human Research Ethics Committee on +44 3735 4375 (or research-ethics@griffith.edu.au) if I have any concerns about the ethical conduct of the project; and

☐ I agree to participate in the project.
<table>
<thead>
<tr>
<th>Name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>
# Safety Justice Discovery Session

## Section 1: About You

1. What Role have you been employed to carry out?  
   - Operator  
   - Supervisor  
   - Project Support  
   - Manager  
   - Senior Leader

2. Gender  
   - Female  
   - Male  
   - Trans Gender  
   - Not Disclosed

3. How long have you been in industry?  
   - 0-3 Months  
   - 3-12 Months  
   - 1-5 Years  
   - 6-10 Years  
   - Over 10 Years

## Section 2: Your Own Experiences

1. How does our current safety justice system impact trust and learning in the workplace?  
   - Compare with previous experiences in different workplaces  
   - Thoughts on the language used to describe the process

2. Give us your opinion on the safety reporting culture on the project?  
   - Willingness to report  
   - Action taken  
   - Treatment of those who report  
   - Treatment of those involved in the issue

3. Provide me with your views on your own experience of the accident process and how justice and learning is achieved following an accident?
- The outcome
- The methods used to achieve them
- The treatment of the people involved

4. Tell me of a time you believed a safety injustice occurred in the workplace, either to you or somebody else?
   - How did that make you feel?
   - How did it affect the workplace?

5. Is there anything else you would like to ask me?
APPENDIX B: EXAMPLES OF THE RECOMMENDED ACTIONS

Table 9: Examples of Human-Focused Recommendations

<table>
<thead>
<tr>
<th>Condition</th>
<th>Classification</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Punish the people involved</td>
<td>Disciplinary action against supervisors for improper briefing</td>
</tr>
<tr>
<td>1</td>
<td>Punish the people involved</td>
<td>Immediate dismissal of mechanical crew</td>
</tr>
<tr>
<td>1</td>
<td>Non-punitve action focused on the people involved</td>
<td>Training/re-briefing for teams on working procedures</td>
</tr>
<tr>
<td>1</td>
<td>Non-punitve action focused on the people involved</td>
<td>Brief/retrain operatives to comply with approved RAMS. Brief/retrain supervisor on duties to ensure compliance with RAMS, i.e., correct equipment available, fit for purpose, ensure operatives understand and comply</td>
</tr>
<tr>
<td>2</td>
<td>Non-punitve action focused on the people involved</td>
<td>Better training or the appropriate tools for the task</td>
</tr>
<tr>
<td>2</td>
<td>Non-punitve action focused on the people involved</td>
<td>Provide adequate training to update existing skills</td>
</tr>
<tr>
<td>3</td>
<td>Non-punitve action focused on the people involved</td>
<td>POWRA - retraining is required. A POWRA should only be done at the point of work. If done correctly, factors such as the lack of correct tools, unsuitable mats, unused lanyards and incomplete scaffolding should prevent the job being started until all these aspects are solved</td>
</tr>
<tr>
<td>Condition</td>
<td>Classification</td>
<td>Recommended Action</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>1</td>
<td>Reinforcement or change to the work practices specifically involved in accident (in this protecting against dropped tools)</td>
<td>Given the scope of the overall works, all tools should be fitted with lanyards and their use made compulsory with recorded training given to all operatives</td>
</tr>
<tr>
<td>1</td>
<td>Change to induction training</td>
<td>Reinforcement or change to practices not directly involved in the incident (e.g. toolbox talks, site coordination, competency management)</td>
</tr>
<tr>
<td>1</td>
<td>Changes in documents</td>
<td>HOLD POINT in RAMS. Appointed Supervisory Staff (Person in Charge) should check and confirm Risk Assessments have been read, that all safeguards and risk prevention/mitigation measures are in place prior to the work commencing (mats, nets, barriered impact areas below, lanyards, tools), and are signed off before commencement, especially high risk and safety critical works.</td>
</tr>
<tr>
<td>2</td>
<td>Reinforcement or change to the work practices specifically involved in accident (in this protecting against dropped tools)</td>
<td>Competent scaffold inspection should be done weekly.</td>
</tr>
<tr>
<td>2</td>
<td>Reinforcement or change to practices not directly involved in the accident (e.g. toolbox talks, site coordination, competency management)</td>
<td>Pre-start briefs should be introduced between different trade team leaders to achieve better communication.</td>
</tr>
<tr>
<td>2</td>
<td>Changes to the physical workplace</td>
<td>Adequate protection of assets should be applied to equipment.</td>
</tr>
<tr>
<td>3</td>
<td>Reinforcement or change to the work practices specifically involved in accident (in this protecting against dropped tools)</td>
<td>Apply exclusion zones below teams working on scaffolding. Rotate teams working so that an area is always available to work. Tag scaffolds when complete and safe to use, install signage, improve communication.</td>
</tr>
<tr>
<td>Condition</td>
<td>Classification</td>
<td>Recommended Action</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>3</td>
<td>Reinforcement or change to practices not directly involved in the accident (e.g. toolbox talks, site coordination, competency management)</td>
<td>Managers to reconsider commercial embargos when relating to safety as low costs that are avoided might cause great losses following an accident.</td>
</tr>
<tr>
<td>3</td>
<td>One-off actions such as communicating about the accident, or reviewing the risk register in light of the accident</td>
<td>Use this adverse event to highlight to management the potential consequences that upstream commercial/programme decisions can have on downstream operations. Introduces additional variables – ‘blindsided’.</td>
</tr>
</tbody>
</table>
### Table 11: Examples of Counterfactual Recommendations

<table>
<thead>
<tr>
<th>Condition</th>
<th>Counterfactual Classification</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Human</td>
<td>Workers should have used the tool lanyards.</td>
</tr>
<tr>
<td>1</td>
<td>System</td>
<td>Have the correct tools for the job. If the correct sized torque tool had been available there would have been no need for the torque multiplier. This would have meant that there would only have been a single tool for Jim to work with, reducing the chance of dropping it.</td>
</tr>
<tr>
<td>2</td>
<td>Human</td>
<td>Badly laid out platform/work area.</td>
</tr>
<tr>
<td>2</td>
<td>System</td>
<td>Money was a problem which led to corners being cut.</td>
</tr>
<tr>
<td>3</td>
<td>Human</td>
<td>Rushing, lack of communication, badly briefed, bad supervision, briefings should have been held in a better place.</td>
</tr>
<tr>
<td>3</td>
<td>System</td>
<td>Change the culture associated with Safety Paperwork. Both Operatives stated that the POWRA would be used ‘against them’ if something went wrong. POWRA are there to prevent accidents, not to apportion blame. Form should have also been amended to reflect the actual method of work</td>
</tr>
</tbody>
</table>
APPENDIX C: REPORT VARIANT 1

<table>
<thead>
<tr>
<th>Incident / Incident No:</th>
<th>11111</th>
<th>Incident Date:</th>
<th>22-09-2017</th>
</tr>
</thead>
</table>

**DETAILS OF PERSONS INVESTIGATING INCIDENT**

<table>
<thead>
<tr>
<th>Team Leader Name</th>
<th>Name</th>
<th>Position</th>
<th>Project Safety Manager</th>
<th>Contact No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>John Smith</td>
<td>Position</td>
<td>Project Safety Manager</td>
<td>555-1234</td>
</tr>
<tr>
<td></td>
<td>Peter Parker</td>
<td>Position</td>
<td>Senior Safety Advisor</td>
<td>555-2345</td>
</tr>
</tbody>
</table>

**BASIC INCIDENT DETAILS**

<table>
<thead>
<tr>
<th>Incident Date (dd/mm/yy)</th>
<th>Incident Time (24 hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-09-2017</td>
<td>09:00am</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident Site Address</th>
<th>London</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Location of Incident on Site</th>
<th>Brine Concentrator 1</th>
</tr>
</thead>
</table>

**Person Responsible for Workplace**

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Phone</th>
<th>Position</th>
<th>Employer</th>
<th>Witness</th>
<th>Statement Attached</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Johnson</td>
<td>555-3456</td>
<td>Mechanical Fitter</td>
<td>Perfect Construction Ltd.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
<tr>
<td>Ben Benson</td>
<td>555-4567</td>
<td>Mechanical Fitter</td>
<td>Perfect Construction Ltd.</td>
<td>☑️</td>
<td>☑️</td>
</tr>
</tbody>
</table>
STEP 3: Give a DETAILED DESCRIPTION of the incident

On Friday the 22nd of September 2017 at the 07:30am Daily Activity Briefing (DAB), Mike Michaels, the Mechanical Supervisor, tasked Jim Johnson and Ben Benson with carrying out works at the top of Brine Concentrator 1. It was also addressed by Mike Michaels at his pre-start that Superior Insulation would be working in the same area, though the workers associated with the incident later reported that they did not hear this advice.

Jim and Ben set off after their DAB to get the tools required for their task, which was to torque the bolts to the flange on the man way covers on BC1. Once they had acquired the torque wrench that they required for their task, they proceeded back to the base of BC1. They then went their separate ways as Jim went to the Main Process Building in order to get a torque multiplier and Ben went down to the Lime Silos in order to get tool lanyards for their task. These lanyards were items that he owned. They were not issued by the stores. Jim stated that he would have preferred to use a ¾ inch drive torque wrench but there were only ½ inch drive torque wrenches available. ¾ inch drive torque wrenches were requested but were unavailable due to commercial reasons. This then necessitated the requirement to use a torque multiplier.
Once they had both collected their required tools, they again reconvened below BC1 where they met Steve Stevenson from UK Gas Ltd., who was there to carry out a visual inspection to confirm the cleanliness of the flood box inside BC 1. They received Clive Conlan’s permission by radio for access to BC1 before making their way to the top of BC1; as read by the access procedure in force. Ben Benson saw Superior Insulation workers working on the scaffold as he was walking up to his work area and he never communicated to them that he would be working above them. Once Jim Johnson, Ben Benson and Steve Stevenson reached the top floor, they showed Steve the inside of the BC before closing up the door. Steve then left the area.

![Figure 3: Brine Concentrator Door](image)

Both Jim and Ben commenced work on the door. The nuts, bolts and washers were installed and hand tightened. The bolts on the doorway were then numbered sequentially. Ben took the torque multiplier from its box, carried out some required calculations, set the tool up and then handed the tool to Jim. Jim then placed the multiplier over nut number 1. He asked Ben to hand him the torque wrench. It was at this moment that he knocked the multiplier off of the bolt and it bounced on the scaffold before falling 8 floors (16 metres) below. There had been no lanyard on the tool and no drop mats in place, despite the worker’s Point of Work Risk Assessment (POWRA) highlighting both of these controls. The lanyards had remained in Ben Benson’s bag, which was at the work front. There was also the fact that Ben Benson did not sign onto the task POWRA.

![Figure 4: Work Area with Visible Gaps](image)

![Figure 5: Damage to Brine Concentrator – Post-Impact](image)

No catch net had been taken from the stores up to the work front.
The tool that fell weighed 3.8 kg and hit with a force of approximately 607 kg, based on subsequent calculations.

After the event, Ben proceeded down the scaffold stairs before finding the tool 8 floors below. It was lying next to the Superior Insulation crew. At the time of the event, they had been standing approximately 3 metres away. Once Ben had seen that Superior Insulations’ workers were not injured, he alerted Jim, who came down and apologized. Jim then called Mike and alerted him of the incident.

Once Mike arrived, he secured the scene before calling the site Safety Manager. John Smith then began an investigation. Both workers returned negative results when drug and alcohol tested.
### STEP 4: BASIC LEVEL INCIDENT ANALYSIS

1. **List Elements**

List the “people”, “equipment”, and “environment” elements involved in the incident

<table>
<thead>
<tr>
<th>PEOPLE</th>
<th>EQUIPMENT</th>
<th>ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Johnson</td>
<td>Norbar Torque</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Wrench Multiplier</td>
<td>09:00am</td>
</tr>
<tr>
<td></td>
<td>HT3 3/4</td>
<td></td>
</tr>
<tr>
<td>Kevin Kelvin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ben Benson</td>
<td>Torque Wrench</td>
<td>Lighting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good</td>
</tr>
<tr>
<td>Lionel Leslie</td>
<td>Tool Lanyards</td>
<td>Climate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Warm</td>
</tr>
<tr>
<td>Mike Michaels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Justin James</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clive Conlan</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. **List Factors**

For each element listed above identify essential and contributing factors based on the focusing questions in the left hand column.

*Essential* = factor is essential for damage to occur.

*Contributing* = factor increases the likelihood damage occurs but removal may not interrupt incident

### ESSENTIAL AND CONTRIBUTING FACTORS

- BOTH SUPERIOR INSULATION AND THE MECHANICAL CREW WERE TOLD AT THE DAILY ACTIVITY BRIEF THAT THERE WOULD BE OTHER WORK CREWS IN THEIR AREA BUT THEY ADVISED THAT THIS MESSAGE HAD NOT BEEN HEARD BY THEM

- THE MECHANICAL CREW DID NOT COMMUNICATE WITH THE SUPERIOR INSULATION CREW BEFORE CARRYING OUT WORKS ABOVE THEM
THE WORKERS STATED ON THEIR POWRA THAT DROP MATS AND TOOL LANYARDS WERE REQUIRED BUT THESE CONTROLS WERE NOT IMPLEMENTED

THE WORKERS HAD THE TOOL LANYARDS AT THE JOB FRONT BUT DID NOT USE THEM

THE RAMS STATED THE REQUIREMENT FOR DROP MATS WHEN WORKING AT HEIGHT

<table>
<thead>
<tr>
<th>ESSENTIAL AND CONTRIBUTING FACTORS (cont)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Environment Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE MOST SUITABLE TOOL FOR THE TASK, A (\frac{3}{4}) TORQUE WRENCH, WAS UNAVAILABLE TO THE WORKERS AT THE TIME OF THE INCIDENT</td>
</tr>
</tbody>
</table>

3. Identify ‘Effectively’ Controllable Factors

From the list of essential/contributing factors listed above identify factors that are EFFECTIVELY controllable by placing a ✔ or ✗ against each factor. Remember the VAACS criteria for ‘Effectiveness’;

- **Viable:** - practical, workable, and no new risks.

- **Affordable:** - within the constraints of capital / cash flow / business viability.

- **Acceptable:** - to the end users / owners.

- **Compatible:** - with the level of damage being managed. (High levels of damage require high levels of control. E.g. engineering)

- **Sustainable:** - over time for medium and high levels of damage.

4. List Recommendations

From the **effectively controllable factors**, identified above, list corrective/preventative actions to manage this incident into the future.

**STEP 5: IDENTIFY CORRECTIVE / PREVENTATIVE ACTIONS**

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## APPENDIX D: REPORT VARIANT 2

### DETAILS OF PERSONS EXPLORING THE ACCIDENT

<table>
<thead>
<tr>
<th>Team Name</th>
<th>Leader Name</th>
<th>Position</th>
<th>Project Manager</th>
<th>Safety</th>
<th>Contact No.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>John Smith</td>
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<td></td>
<td></td>
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<td>Peter Parker</td>
<td></td>
<td>Senior Advisor</td>
<td></td>
<td>555-2345</td>
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### BASIC ACCIDENT DETAILS

- **Accident Date (dd/mm/yy)**: 22-09-2017
- **Incident Time (24 hr)**: 09:00am
- **Accident Site Address**: London
- **Location of Accident on Site**: Brine Concentrator 1
- **Person Responsible for Workplace**: Mark Masterson

### STEP 1: Accident Level Classification

- **Actual Injury**: The class of actual injury was - Nil
- **Potential Injury**: The maximum reasonable potential class of injury was – High

### STEP 2: Observation / Information Gathering

**Instructions for Gathering Information**

1. **Conduct Discovery Sessions with the Team Involved** – include witnesses / supervisors / experts
2. **Analyse the Accident Scene** – take measurements (do not guess), photos, videos, drawings, diagrams / sketches
3. **Collect related documentation which can compare work planned vs. work done** – Attach additional material as appropriate such as POWRA, RAMS, Risk Assessments, induction records, toolbox talks, DABs, H&S Committee minutes, relevant design documentation, operator’s manuals.

### List of Persons Involved (Full name and contact phone number)

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Phone</th>
<th>Position</th>
<th>Employer</th>
<th>Witness</th>
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<tr>
<td>Jim Johnson</td>
<td>555-3456</td>
<td>Mechanical Fitter</td>
<td>Perfect Construction Ltd.</td>
<td>☒</td>
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<tr>
<td>Ben Benson</td>
<td>555-4567</td>
<td>Mechanical Fitter</td>
<td>Perfect Construction Ltd.</td>
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<td>☒</td>
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<tr>
<td>Lionel Leslie</td>
<td>555-5678</td>
<td>Cladding Specialist</td>
<td>Superior Insulation</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>Mike Michaels</td>
<td>555-6789</td>
<td>Mechanical Supervisor</td>
<td>Perfect Construction Ltd.</td>
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<td>☒</td>
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<tr>
<td>Clive Conlan</td>
<td>555-8901</td>
<td>Scaffold Working Supervisor</td>
<td>Perfect Construction Ltd.</td>
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**LIST OF ATTACHMENTS**

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<td>Best Practice Guide – Dropped Objects</td>
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<td>Mike Michaels – Task Allocation Sheet Example</td>
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<td>DABS – 22-09-2017</td>
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<td>Mike Michaels Inspection – 07-08-2017</td>
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<td>Mike Michaels Inspection – 22-08-2017</td>
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<td>12</td>
<td>Jim Johnson - Site Induction</td>
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<td>14</td>
<td>Jim Johnson - Skills Assessment</td>
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<td>Ben Benson - Skills Assessment</td>
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**COMMENTS**

**STEP 3:** Give a DETAILED DESCRIPTION of the Accident
On Friday the 22\textsuperscript{nd} of September 2017, a work crew were sealing a door closed on a Brine Concentrator (BC) via a scaffold structure 30 metres high when the torque multiplier being used to torque the bolts dropped through a gap in the scaffold structure to an area 16 metres below.

The object struck the BC vessel approximately 3 metres from an insulation team’s work area.
Figure 5: Damage to Brine Concentrator – Post-Impact

SWOT Analysis

**DAILY ACTIVITY BRIEFING (DAB)**

**STRENGTHS (+)**
- Provides forum which allows each team member to understand and discuss their allocated works for the day
- Ensures safety critical information is communicated in a timely manner
- Allows subcontractors to gain an insight into the other works in their area and to ensure all the other work parties are aware of their activities

**WEAKNESSES (−)**
- Communication is greatly impeded by the nearby generator which is required to run 24/7

**OPPORTUNITIES (+)**
- By relocating the DAB area to an alternative, quieter area away from the generator, there would no longer be a communication barrier

**THREATS (−)**
- Site space is highly restricted, which may make it difficult to source an alternative area for the DAB, all of which are currently owned by other disciplines and sub-contractors.
### PERSONNEL

**STRENGTHS (+)**
- All those in the team are trade qualified and highly experienced in the industrial sector.
- The team leader has served as a supervisor for a number of years and has vast experience in the industrial discipline.
- The superior repair and industrial welding specialist with a great deal of experience on similar projects is within the team.
- Many of the mechanical team and superior insulation, including the pipework, needed on the boiler house were built prior to the project, giving them valuable knowledge regarding the pipe, tank, and the solutions required.

**WEAKNESSES (-)**
- The mechanical team currently is resource deficient, with the team struggling to keep up with the works programming, which is extremely aggressive.

**OPPORTUNITIES (+)**
- Provide budget to source more labour so that the pressures created by the works programme can be met.

**THREATS (-)**
- The project is currently losing a considerable amount of money which may limit any opportunity for sourcing additional personnel due to enrolments.
- It currently takes 8 weeks approximately to onboard a new recruit due to difficulties which exist within the recruitment process and the remuneration of the project.

### TOOLS AND EQUIPMENT

**STRENGTHS (+)**
- The torque multiplier and torque wrench used for the task were fully calibrated and in good working order.

**WEAKNESSES (-)**
- The 1/2 inch torque wrench used requires the use of a 3/4 inch torque multiplier to be compatible with the bolts on the delta concentration doors.
- The 5/8 inch torque wrench are unavailable at site due to commercial constraints faced by the project.
- The disc mats provided by the site have no means of connection to a structure to prevent dropped objects from the work area.

**OPPORTUNITIES (+)**
- Carry out a site-wide review with each discipline to determine any deficiencies in the equipment provided and the additions and replacements needed to ensure personnel have the most suitable equipment for their tasks.

**THREATS (-)**
- The commercial constraints on the project may not have the ability to allow for the equipment requested, something which may also have a negative impact on the trust between the work crews and their management.
- There is currently a long waiting time for all new equipment due to the complicated procurement process which may impact any new equipment sourcing.
**WORK ENVIRONMENT**

**STRENGTHS (+)**
- The scaffold structure provides easy access to the main concentrators in a systematically spaced and provides safe access to the upper levels of the main concentrators.

**WEAKNESSES (-)**
- The scaffold structure is not fully enclosed, which creates the potential for equipment to fall through the gaps from height.
- The tasks of welding and insulating the scaffolding were only completed at height due to the need to avoid the work process, which led to an overall increase in cost.

**OPPORTUNITIES (+)**
- A scaffold structure fully enclosed with netting would prevent dropped objects and eliminate the need for drop nets and tools.
- Capture lessons learned within corporate systems for future projects to ensure all workers are aware of the concentrators are completed prior to operation.

**THREATS (-)**
- The scaffold team are also responsible for setting up the work area, which can make it difficult for them to work the setting without adding risk to their own work.

---

**TASK EXECUTION**

**STRENGTHS (+)**
- The team were suitably qualified and experienced.
- The insulations were all completed as per requirements.

**WEAKNESSES (-)**
- Tool demands and drop nets were not used to prevent a dropped tool.
- The insulation team were unaware of the mechanical team above them.

**OPPORTUNITIES (+)**
- The scaffold can pre-fit all tools used at height with a scaffold tower to assist the area.
- Daily Activity briefing begins can be reviewed to ensure there are no communication barriers in existence.

**THREATS (-)**
- The scaffold is very restricted in regards to space, which may limit any opportunities to provide tool-in-use briefing areas for all teams.

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<table>
<thead>
<tr>
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## APPENDIX E: REPORT VARIANT 3

### DETAILS OF PERSONS EXPLORING THE ACCIDENT

<table>
<thead>
<tr>
<th>Team Leader Name</th>
<th>Position</th>
<th>Project Safety Manager</th>
<th>Contact No.</th>
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<tr>
<td>John Smith</td>
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<td>555-1234</td>
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<table>
<thead>
<tr>
<th>Team Member Name</th>
<th>Position</th>
<th>Senior Safety Advisor</th>
<th>Contact No.</th>
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</thead>
<tbody>
<tr>
<td>Peter Parker</td>
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</table>

### BASIC ACCIDENT DETAILS

<table>
<thead>
<tr>
<th>Accident Date (dd/mm/yy)</th>
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<tbody>
<tr>
<td>22-09-2017</td>
<td>09:00am</td>
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<table>
<thead>
<tr>
<th>Person Responsible for Workplace</th>
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</thead>
<tbody>
<tr>
<td>Mark Masterson</td>
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### STEP 1: Accident Level Classification

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<tbody>
<tr>
<td>The class of actual injury was - Nil</td>
<td>The maximum reasonable potential class of injury was – High</td>
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</tbody>
</table>

### STEP 2: Observation / Information Gathering

**Instructions for Gathering Information**

Our first priority is to understand the accident and how the damage was sustained.

1. **Conduct Discovery Sessions with the Team Involved** – include witnesses / supervisors / experts
2. **Analyse the Accident Scene** – take measurements (do not guess), photos, videos, drawings, diagrams / sketches
3. **Collect related documentation which can compare work planned vs. work done** – Attach additional material as appropriate such as POWRA, RAMS, Risk Assessments, induction records, toolbox talks, DABs, H&S Committee minutes, relevant design documentation, operator’s manuals.

### List of Persons Involved (Full name and contact phone number)

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Phone</th>
<th>Position</th>
<th>Employer</th>
<th>Witness</th>
<th>Discovery Session Attached</th>
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<tbody>
<tr>
<td>Jim Johnson</td>
<td>555-3456</td>
<td>Mechanical Fitter</td>
<td>Perfect Construction Ltd.</td>
<td></td>
<td>Yes</td>
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<tr>
<td>Ben Benson</td>
<td>555-4567</td>
<td>Mechanical Fitter</td>
<td>Perfect Construction Ltd.</td>
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<tr>
<td>Lionel Leslie</td>
<td>555-5678</td>
<td>Cladding Specialist</td>
<td>Superior Insulation</td>
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<tr>
<td>Mike Michaels</td>
<td>555-6789</td>
<td>Mechanical Supervisor</td>
<td>Perfect Construction Ltd.</td>
<td></td>
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</tbody>
</table>
STEP 3: Give a DETAILED DESCRIPTION of the Accident

On Friday the 23\(^{rd}\) of September 2017, the door of a Brine Concentrator was being secured with nuts when an accident occurred where the tool being used, a torque multiplier weighing 3.8 kg, slipped from the nut it was being used to tighten and fell through a gap in the scaffold deck onto a level 16 metres below, where a team on insulators were carrying out works.

Below are the accounts of those involved:

Jim Johnson – Mechanical Fitter

At our morning briefing, Mike, our supervisor, tasked Ben and I with helping Steve from UK Gas Ltd. carry out an inspection of the inside of Brine Concentrator (BC) 1 prior to its top entrance being sealed. Steve, who was also attending our briefing, said that he would meet us at the BC 1 gate at around 08:30am. Apparently Mike also told us at the briefing about Superior Insulation also working on BC1 on a lower level than us but I definitely did not hear that. In saying that, that does not mean he did not say as it would not be the first time we did not hear some of Mike's announcements due to that stupid generator running right behind our briefing area.

![Figure 1: Brine Concentrator 1](image)

Once the briefing was over, Ben and I headed over to the stores to get the gear we needed to carry out the job. We were only able to get the ½ inch drive torque wrench from Al the store man as all of the torque multipliers were in the field. Really and truly, what we really needed was a ¾ inch drive torque wrench for this kind of job as this would have meant not having to use a heavy and awkward torque multiplier at height. Unfortunately, when we asked about buying some, Mike told us that the financial problems faced by the project meant that there was a freeze on buying any new equipment which meant we just had to make do with what we had.

Without the torque multiplier, there was no way of doing the job but luckily enough I knew one of the guys who had one out from the stores.
Ben and I headed over to the BC1 gate to drop off the torque wrench at the base. While there, we also carried out our Point of Work Risk Assessment (POWRA) to get it out of the way. I then headed off to the Main Process Building (MPB) to borrow the torque multiplier for the job while Ben headed to the Lime Silo area as he had left his tool lanyards down there the day before when we were down there installing the internal hopper.

By the time we both got back to BC1, Steve from UK Gas was waiting on us at the gate. Before entering, we were required to gain permission from the area owner, who at the time was Justin James, the Scaffold Superintendent. Justin being the area owner, created 2 problems:

1. He never answered calls via phone or radio
2. He had no understanding of our works which meant he definitely did not see it as a priority

As per usual, we got no response from Justin. Instead, we called Clive Conlan, his 2nd in command, who came over quickly and signed us into the area. He did not seem to really care what our task was as he himself was fairly loaded with works on the other BCs, where the scaffold systems had yet to be finished and were behind schedule.

Steve, Ben and I headed up the scaffold to the upper BC door. Steve, armed with a torch, stepped into the vessel and carried out his inspection. After giving us the thumbs up, Steve headed off back down the scaffold stairs. We were glad to get the inspection out of the way as it was a BC1 hold point and we were already a week behind program already and the milestone only round the corner in November.

With Steve now gone, Ben and I gave the POWRA a final look to ensure we did not miss anything we could be pinged for afterwards. We did write down the use of rubber mats to prevent dropped objects but the problem we had was the site bought cheap mats which are useless in preventing a dropped object because they do not have the metal rings that the good ones have which allow you to connect them to a railing. Anything that hits the site mats just falls through as the mat is not secured.

To be honest, on any other job I’ve been on that has a lot of working at heights on a scaffold, the scaffold is usually fully insulated with netting to prevent anything from dropping.

We then pushed the door of the BC shut and set up our work area, with the tools well away from the gaps in the scaffold. We first placed all of the nuts on the door bolts. This was a job that we had to be really careful with as one slip of the finger could have meant a nut dropping to the floors below.

Once all the nuts were on and numbered correctly, we moving to the torque phase. I was lead and Ben was support. Ben handed me the torque multiplier and I placed it carefully on the bolt number 1. I never even noticed that it did not have a lanyard attached. Ben then handed me the torque wrench but as he did, my other arm made contact with torque multiplier and it slipped from the nut and fell below. I froze for a second while Ben ran down the scaffold to see where it landed. After a few seconds I came to my senses when I heard shouting from below.
I ran down the scaffold stairs and found Ben 6-7 floors below talking to the Superior Insulation guys who looked in shock. The torque multiplier had landed only yards from where they were working but luckily no one was hurt. I apologies profusely for my mistake to the guys. I then called Mike and told him about the accident. Mike arrived a few minutes later and secured the scene before calling John, the Safety Manager. Once John came, Ben and I were sent for D and A tests and sat in a room waiting on you.

Ben Benson – Mechanical Fitter

We started off our day at our morning briefing with Mike, our supervisor. Jim and I were given the task of babysitting Steve from UK Gas while he inspected the inside of BC1. We were then to immediately secure the door and torque the bolts. The issue we immediately saw was the bolts on the door needed a ½ inch drive torque wrench but we only had ¾ inch drive torque wrenches. The reason for this was because site refused to buy them due to additional costs and the current buying freeze due the project loosing shit loads of money.

We met Steve from UK Gas after the briefing and we agreed to meet at the BC1 access gate at 08:30am. We then headed off to the stores to get our torque wrench and a torque multiplier. When we got there, Al the store man told us that he was all out of torque multipliers but he had the ¾ inch torque wrench. Luckily, Jim knew that Mark in the MPB had one and, since Mark owed him a few favours by now, he would use this to cash one in. I did not bother getting any tool lanyards from Al as the quality of his were poor and my own, which were in the Lime Silo area, were much more suitable for holding a 4kg tool in place.

When we had gotten what we needed from Al, we walked back to the BC1 gate and dropped off the torque wrench and wrote up our POWRA for the planned job. Jim then headed towards the MPB to collect his torque multiplier while I headed to the Lime Silos to collect my tool lanyards.

While down at the Silos I also saw the rubber mats I had used for the job we had done there the day before on the hopper. I did not bother bringing them with me as they were useless in stopping anything from dropping as they had no way of securing them to anything.

Jim and I reconvened at the BC1 gate where Steve from UK Gas was now waiting for us. We tried calling Justin, the area owner, but as usual he did not answer. Jim then called Clive, his blue hat, and he came over and allowed us in. The usual protocol is for the area owner to walk out the task with the guys before
authorizing but poor Clive clearly did not have time for this as his scaffold team was behind. The milestone targets that were agreed for these BCs were ridiculous which meant that everybody was chasing their tail trying to hit dates they never agreed to in the first place.

Jim and I, with our tools with us, headed up the scaffold with Steve. We walked past Superior Insulation but at the time I never even noticed that they were there.

Once we reached the BC door, Steve gave the inside of the BC a swift inspection before giving us the thumbs up and heading off. As always, we gave the POWRA a quick once over to ensure we had not missed anything that could be used against us later. In hindsight, I probably should have removed the rubber mats from it, but it did not cross my mind at the time.

We set up our workspace so that there was minimal movement for us to do. We were well aware of the gaps in the scaffold so we had to keep all of our gear well away from these. Instead of leaving the bucket of nuts under Jim while he placed them, we kept them beside me behind him and I handed them to him. A bucket of nuts falling through a gap can cause a lot of damage!

When all the nuts were placed and numbered, Jim asked me to hand him the torque multiplier. I instinctively reached for it and handed to him. He carefully placed it on bolt number 1 before reaching back for the torque wrench I was about to hand him. It was then I heard a noise and Jim said “oh shit”. I looked to where the multiplier was and all that was left was the bolt and nut and then we heard a bang. My first thought was, “I forgot to put the lanyard on the multiplier.” The only reason I can think of that caused this was fatigue. Due to manpower shortages, I worked through my last R&R and Friday was my 19th day straight on site and these 12 hour days take their toll.

I instinctively ran down the stairs and about 7 rows down I found the tool lying beside the Superior Insulation guys, who up until that point, I did not even know were there. They were both quite ashen faced and when I asked them if they were ok, all I got was a mumble. I looked around at the BC and saw a big dent where the tool had made contact.

Jim came down after me and when he saw the Superior Insulation guys he apologized profusely. He then rang Mike to come down.

When Mike arrived, he had a look at what happened and had a quick chat with the insulation guys to ensure they were ok. He then rang John, the Safety Mgr., to come down and have a look. When John arrived, Jim and I were sent for D and A.

Mike Michaels – Works Supervisor

As usual, we started off with our morning brief. I gave all the boys their tasks and I asked if there were any issues from the previous day. The only issue raised was the noise of the generator behind us and how it made it difficult to hear what I was saying. Unfortunately, this was the only area we could use for the briefing and the generator was required to run 24/7 to power the welfare facilities.

I then ran through the areas where there was specific risk. One of them was the Superior Insulation boys working a few floors under Jim and Ben.

After the briefing was over, I headed over to the induction room to meet my 2 new starters. We’re under manned at the moment and I’m finding it impossible to hit the targets set by Project Controls, (none of whom have ever built a treatment plant). The new starters were badly needed but it meant half my day was going to be taken up with getting them the basics so they could work onsite.

I got a phone call around 9am about the accident. I went over straight away to see how bad it was. When I arrived, I saw that it was pretty bad. Jim’s torque multiplier had fallen through a scaffold gap and landed 8 floors below near the Superior Insulation guys.
When I saw what had happened and how it had happened, I was angry.

The original design of the scaffold structure included the requirement for the scaffold to be fully meshed and with drop nets to cover the gap between the scaffold and the BC. This never got done because the scaffold team is under resourced and they were told to move to BC2 as soon as the basic scaffold structure was erected to ensure we hit the milestone. The milestone is the 1st of November and if we do not hit it, the project loses out on £20 million.

The tool which dropped should never have had to be used either. You only have to use a multiplier when the torque wrench being used does not suit the bolt being torqued. The boys asked me for ½ inch drive torque wrenches months ago but when I put in the purchase order, it was rejected because our corporate commercial team had put a freeze on the ordering off new equipment due to the money being lost on the project.

After a chat with the insulation boys to see if they were ok, I rang John Smith, the Safety Mgr. and told him what had happened. He came down shortly afterwards and assessed the area. He then sent Jim and Ben away for D and A while I rang Mark, the Project Director and told him the bad news and that his BC works would be delayed.

**Lionel Leslie – Cladding Specialist**

I attended Mike’s morning briefing and listened as he allocated his team their tasks. I did not really hear much of what he was saying as the generator beside us is extremely noisy and smothers a lot of the conversation. Someone told me after the accident that he spoke about Jim and Ben working above us but I never heard this; probably because of the noise.

Pete and I grabbed our tools and headed off to BC1. Clive was just at the gate with his own guys and he signed us into the area.

On floor 3, we started carrying out repair work at the back of the BC, with the staircase on the opposite side. We slowly made our way around the vessel. At around 09:00am, we heard a loud bang and a tool bounced off the BC and landed on the scaffold floor beside us. I was in shock as I did not know anyone was above us and I had not seen anyone walk by.

After a minute or so of silence, Ben Benson came running down and looked towards the tool. He then began apologizing for what had happened. A minute or so later, Jim Johnson appeared and again began apologizing profusely for what had happened. I could not say much at the time as I was still thinking about how close I had come to being smashed by a tool.

Mike arrived soon after and again asked us if we were ok.

Soon after the Safety Manager came and began asking questions.

**Clive Conlan – Scaffold Working Supervisor**

I got a call from Jim Johnson at about 08:30am about getting onto the BC1 scaffold. I was on BC2 at the time and as we are behind schedule and I’m a few men down, I had to rush them through the sign in and did not have time to talk them through the other works in the area, which I would normally do. I am not even supposed to be the area owner, but my supervisor was unreachable, so I got stuck with doing it on the day.

At around 09:30, I heard they had an accident, but nobody was hurt. The tool would never have fallen through the gap had we been given time to install the mesh and the nets like we were supposed to. Instead we were rushed over to BC2 to start the scaffold on it. These milestone targets will be the death of someone.
### STEP 4: BASIC LEVEL ACCIDENT EXPLORATION

#### 1. List Elements

List the “people”, “equipment”, and “environment” elements involved in the incident

<table>
<thead>
<tr>
<th>PEOPLE</th>
<th>EQUIPMENT</th>
<th>ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Johnson</td>
<td>Norbar Torque Wrench Multiplier HT3 3/4</td>
<td>Time 09:00am</td>
</tr>
<tr>
<td>Ben Benson</td>
<td>Torque Wrench</td>
<td>Lighting</td>
</tr>
<tr>
<td>Lionel Leslie</td>
<td>Tool Lanyards</td>
<td>Climate</td>
</tr>
<tr>
<td>Mike Michaels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clive Conlan</td>
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</tbody>
</table>

#### 2. List Factors

For each element listed above identify essential and contributing factors based on the focusing questions in the left hand column.

**Essential** = factor is essential for damage to occur.

**Contributing** = factor increases the likelihood damage occurs but removal may not interrupt incident

#### ESSENTIAL AND CONTRIBUTING FACTORS

- **THE LOCATION OF THE BRIEFING AREA NEXT TO A GENERATOR LED TO CRITICAL INFORMATION BEING MISSED BY THE WORK PARTIES**
- **PROGRAMME PRESSURES LED TO ESSENTIAL DROPPED OBJECT PREVENTION SYSTEMS BEING OMITTED FROM THE FINAL DESIGN OF THE BC SCAFFOLD STRUCTURE**
- **A COMMERCIAL EMBARGO LED TO AN ESSENTIAL TOOL FROM BEING PROCURED AND A TOOL NOT SUITABLE FOR THE TASK BEING USED**
- **THE £20 MILLION MILESTONE ACHIEVEMENT REWARD CREATED AN ENVIRONMENT OF TIME AND RESOURCE CONSTRAINTS DUE TO THE CREATION OF AN UNREALISTIC TARGET DATE**
- **TIME PRESSURES LED TO CRITICAL INFORMATION NOT BEING COMMUNICATED DURING THE SIGN IN STAGE WITHIN THE BC AREA**
- **THE RUBBER MATS AVAILABLE ON SITE WERE USELESS WHEN USED TO INSULATE A WORK AREA TO PREVENT DROPPED OBJECTS AS THEY HAD NO MEANS OF CONNECTION TO A STRUCTURE**
- **A FAILURE IN THE FATIGUE MANAGEMENT SYSTEM LED TO A WORKER BEING EXPOSED TO AN EXCESSIVE WORK PATTERN**
3. Identify ‘Effectively’ Controllable Factors

From the list of essential/contributing factors listed above identify factors that are EFFECTIVELY controllable by placing a ✓ or x against each factor. Remember the VAACS criteria for ‘Effectiveness’;

- Viable: - practical, workable, and no new risks.
- Affordable: - within the constraints of capital / cash flow / business viability.
- Acceptable: - to the end users / owners.
- Compatible: - with the level of damage being managed. (High levels of damage require high levels of control. E.g. engineering)
- Sustainable: - over time for medium and high levels of damage.

4. List Recommendations

From the effectively controllable factors, identified above, list corrective/preventative actions to manage this incident into the future.

**STEP 5: IDENTIFY CORRECTIVE / PREVENTATIVE ACTIONS**

<table>
<thead>
<tr>
<th>No</th>
<th>Corrective Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td></td>
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</tbody>
</table>