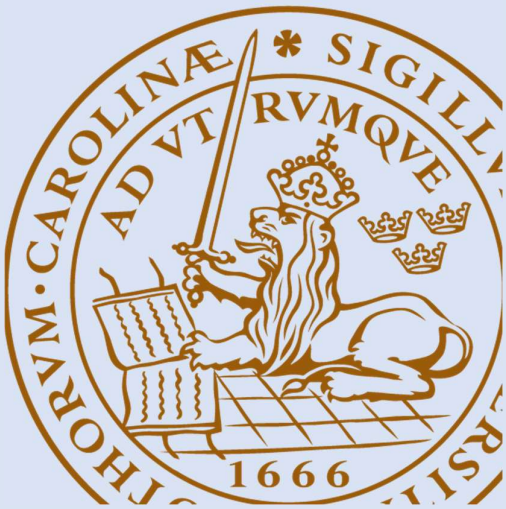
A SYSTEM SAFETY PERSPECTIVE OF 'GROSS NEGLIGENCE' AS INTRODUCED IN REGULATION (EU) 376/2014

Erwin Karsten Langejan | LUND UNIVERSITY



A system safety perspective of 'gross negligence' as introduced in Regulation (EU) 376/2014

Erwin Karsten Langejan

Under the supervision of Dr Anthony Smoker

Lund 2023

Title: A system safety perspective of 'gross negligence' as introduced in Regulation (EU) 376/2014

Erwin Karsten Langejan

Number of pages: 96

Illustrations: 0

Appendixes: 5

Keywords

Ambiguities, aviation, EU, gross negligence, just culture, reporting

Abstract

The main finding of this research is that it is unrealistic to expect that it is possible to create one common European understanding of the boundary between acceptable and unacceptable behaviour; it is only possible to achieve one common European just culture policy if there is one common European understanding of the term 'gross negligence' as introduced in The Regulation. The importance of this finding is directly related to public trust in the legal system of the EU which, in the worst case, can be undermined. The subversion is because of inconsequent application of EU-Regulations. Although beyond the scope of this research, it can be argued that there is a need for an evaluation of the effectiveness of the law-making process in the EU.

Riskhantering och samhällssäkerhet

Lunds tekniska högskola

Lunds universitet
Box 118
221 00 Lund

http://www.risk.lth.se

Telefon: 046 - 222 73 60

Division of Risk Management and Societal Safety

Faculty of Engineering

Lund University

P.O. Box 118

SE - 221 00 Lund

Sweden

http://www.risk.lth.se

Telephone: + 46 - 46 - 222 73 60

Table of Contents

Acronyms and definitions **7**

Acknowledgements **9**

Literature review **11**

Just culture 11

Just culture on state level *12*

Just culture at the corporate level *14*

Human Error 14

Gross negligence 17

Gross negligence in The Regulation *17*

Gross negligence in national penal codes *18*

Socio-legal perspective 19

Systems thinking, just culture and gross negligence 21

Summary of the literature review 23

Research question **24**

Methodology **25**

Data collection 28

Data validity 29

Data analysis 31

Ethical considerations **33**

Findings **35**

Introduction 35

Interview findings 35

Analysis of the interviews by theme 35

Theme 1: Safety *36*

Theme 2: Judiciary *38*

Theme 3: Bureaucracy *41*

Theme 4: EU-integration *43*

Theme 5: Public opinion *44*

Theme 6: Trust *44*

Theme 7: Just Culture *44*

Summary of key findings 46

Document analysis 47

The Proposal *48*

The Draft *48*

The Journal *48*

The Regulation *48*

Guidance material *48*
The Guide *49*
The Document *49*
The Evaluation *50*
Summary of document analysis *50*
Findings summary *50*

Discussion 52

Introduction 52
Gross negligence 52
Gross negligence and the research question *53*
Gross negligence and The Regulation *53*
Gross negligence ≠ gross negligence *59*
Human error 60
Competing discourses 60
Gross negligence as a competing discourse *60*
Competing discourse between (national) governmental institutions *63*
Final reflections and suggestions for further research 64

Conclusion 70

References 72

Appendix A - Example requirement of 'no accident, no incident history', 2022: ..88

Appendix B - Request form no incident/ no accident declaration (Kiwa, 2022) 89

Appendix C - Example of no incident/ no accident declaration: 90

Appendix D – Background of the informants: 91

Appendix E - Competing discourses identified during the research: 93

Appendix F – Screenshot of The Draft: 95

Acronyms and definitions

AAIB – Air Accidents Investigation Branch – United Kingdom

AIBN – Accident Investigation Board Norway

BEA – Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile - The French Civil Aviation Investigation Authority

CAA – Civil Aviation Authority

CAA(UK) – Civil Aviation Authority of the United Kingdom

CJEU – Court of Justice of the European Union

The Draft – EPs draft on The proposal

EASA – European Aviation Safety Agency

EC – European Commission

ECB – European Central Bank

EP – European Parliament

EU – European Union

Gross negligence – Gross negligence as applied in The Definition, unless otherwise specified

Harmonised Protection – Harmonised and enhanced protection as referred to in Article 1(b) of The Regulation.

HRO - High-Reliability Organization

IATA – International Air Transport Association

ICAO – International Civil Aviation Organization

JPG - Joint Practical Guide

SAIA – Swedish Accident Investigation Authority

The Definition – The definition of 'just culture' as defined in Article 2 of The Regulation

The Document – Document ID: ERA-PRG-004-5

The Evaluation – EC Evaluation of Regulation (EU) No 376/2014 {SWD(2021) 31 final}

The Guidance Material – Guidance Material Regulation (EU) 376/2014, version 1, December 2015

The Proposal – EC Proposal, COM (2012), 776 final, Brussels, 2012

The Regulation – Regulation (EU) 376/2014, original version as published on 24. April 2014

The Committee – The European Economic and Social Committee

Uniform Protection – 'Uniform protection' as referred to in Article 1(b) of The Regulation

Acknowledgements

I would like to express my deepest gratitude to all the people who have made this research possible. My thanks are especially addressed to my supervisor, Dr. Anthony Smoker, for our in-depth discussions, his wise advice and his patience.

Many thanks to the other tutors, in particular program manager Johan Bergström, and my fellow students for a wonderful- and rewarding time at the university in Lund. I am also very grateful to the informants for their valuable contributions.

I'd like to acknowledge my gratitude to my wife and children, for their tolerance and support during my study. I am aware that the time which I spent on my thesis has been challenging, but without their patience, it would not have been possible to complete this study.

How to read this thesis

This research consists of three main phases: Literature review, findings, and discussion.

As I am a safety scholar, I explore the term gross negligence from a system safety perspective. Gross negligence is, however, inextricably linked to socio-legal science. I have no background in socio-legal theory. It, therefore, is of the utmost importance to avoid confusion about the scientific anchoring of this research; it is not my intention to suggest that this research satisfies scientific conditions which are applicable in socio-legal sciences such as sociology of law.

The topics discussed in the literature review are a selection of issues which are considered as having considerable importance for a broad understanding of gross negligence and just culture. Although the topics are discussed separately, the research learns that that they are interwoven; they are all interacting with each other. It is recognised that the issues addressed are not complete, but they give sufficient insight to answer the research question.

In the chapter findings, a brief description of the informants and the themes which emerged during the interviews are shared. The chapter includes an analysis of the interviews and an analysis of a selection of documents which were studied during this research.

In the chapter discussion, I share my view of the findings in relation to the research question and that chapter is the basis for the conclusion.

Literature review

The primary purpose of the literature review is to share a selection of literary sources which provide information related to the research question. The secondary purpose of the literature review is to identify possible gaps between this research and existing literature.

Just culture

In The Regulation, 'just culture' is defined as (EU, 2014; p. L122/25):

> a culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, wilful violations and destructive acts are not tolerated.

The objective of The Regulation is "the establishment of common rules in the field of occurrence reporting in civil aviation" (EU, 2014; L122/24). The EC claims that The Regulation is an innovative legal act because "Regulation (EU) No 376/2014 is the first legal act to incorporate "just culture" provisions, thus ensuring its application across all the domains of the aviation at industry as well as at the competent authority level" (EC, 2021; p. 24). The EU argues that The Regulation ensures "harmonised and enhanced protection of reporters and persons mentioned in occurrence reports" (EU, 2014; L122/24). "The sole objective of occurrence reporting is the prevention of accidents and incidents and not to attribute blame or liability" (EU, 2014; L122/24). Including just culture principles in The Regulation, suits the transition from compliance based regulation to performance based regulation in the European aviation industry (EASA, 2014; Woodlock & Hydén, 2020). The definition of just culture in The Regulation, is the same definition as used by Eurocontrol (Eurocontrol, 2005).

Member States and organisations are required to implement a just culture policy, which is in compliance with The Regulation (EU, 2014; EC, 2021). Just culture, as introduced in The Regulation, is an example of "a regulatory risk management strategy in EU civil aviation" (Woodlock & Hydén, 2020; p. 62). Benefits of just culture include increased reporting, trust building and more effective safety and operational management (GAIN, 2004; Eurocontrol, 2005; Eurocontrol, 2006; EC, 2012; EP, 2013; EU, 2014, IATA, 2016; Dekker, 2017; ERA, 2019; EC, 2021).

(Functional) immunity applies to a selection of international organisations, such the ECB and the EU (ECB, 2007; Wessel, 2014). In Italy the Gelli law, limiting (criminal) liability for healthcare workers when some specific requirements are satisfied, was introduced in 2017 (Cupelli, 2017; Coscia, 2020). Pursuant to the Gelli law, in the event of an unintended crime of medical and health care workers, criminal responsibility is limited to cases of gross negligence (Coscia, 2020).

Culture is "the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede, Hofstede & Minkov, 2010, p.6). Furthermore, culture is

characterised as being a collective phenomenon which is learned and in which values are the deepest manifestations of cultures (Hofstede, Hofstede & Minkov, 2010). Reiman & Rollenhagel emphasize the emergent property of culture; cultural emergence refers to patterns, structures or properties emerging at the system level that are difficult or impossible to explain in terms of system's components and their interactions (Reiman & Rollenhagen, 2014).

In recital 36 of The Regulation, just culture is considered to be "an essential element of a broader 'safety culture', which forms the basis of a robust safety management system" (EU, 2014; p. L122/22). The view of the EU is consistent with Reason's safety culture model, in which a safety culture consists of the following components: A learning culture, an informed culture, a just culture, a flexible culture and a reporting culture (Reason, 1997). On the other hand, safety culture cannot simply be instrumentalised and constructed (Busch, 2021).

The literature consulted, offers different aims for 'just culture', but the aims all have in common that human error, which is considered as honest mistakes, is judged as acceptable behaviour with the aim to stimulate occurrence reporting. Just culture acknowledges that experienced professionals make mistakes (Allyn, 2019b). "A just culture is a culture of trust, learning and accountability" (Dekker, 2017; p. ix). Contrary to the EU and Dekker, Allyn does not view just culture as 'a culture' but identifies just culture as a philosophy and concept (Allyn, 2019a).

One of the main challenges of just culture is to create a clear, understandable, border between acceptable and blameworthy behaviour (Dos Santos, 2013; Hollnagel, 2013; Dekker, 2017; Pellegrino, 2019). One of the causes of the difficulty to 'draw the line' is that justice is understood differently by different people; there is no consensus on what 'just' is, and who draws the line (Hollnagel, 2013; Cromie & Bott, 2015; Dekker, 2017). Dekker argues that "The main argument for building a just culture is that *not* having one is bad for both justice and safety" (Dekker, 2017; p. xiii).

Just culture on state level

National criminal law is applied for the administration of justice which results from the application of The Regulation (EC, 2012; EU, 2014). Implementation of just culture in the legal system is associated with open communication and a balanced weighting of interests (Bijlsma, 2013). There is a shortcoming in The Definition as it does not challenge the principle of criminal prosecution (Schubert, 2013).

A crime consists of two elements: Actus reus (the guilty conduct, the external, objective, elements of an offence) and mens rea (the mental element, the internal, subjective, elements of an offence) (Blomsma 2012; Loveless, 2016; Vink, 2017). It can be argued that the effect of penalising negligence can be that people behave more carefully in the future (Panelli & Scarabello, 2013; Loveless, 2016); On the other hand, it can also be argued that it is of little use to punish people for unintentional actions (Loveless, 2016; Michaelides-Mateou & Mateou, 2016; Pellegrino, 2019).

The 'draw the line' issue can be addressed on two levels in a criminal justice policy: When the legislator is concerned with which outcomes are punishable and when the legislator is concerned with which conduct is punishable (dos Santos, 2013). "The right balance between the public interests concerned, flight safety and criminal liability, should be determined by the context of the professional conduct rather than its outcome" (dos Santos, 2013, p. 42).

Daniels identifies a crisis in civil aviation accountability and in the just culture environment; the crisis refers to the tension field between international, safety orientated, aviation regulation and the state sovereignty of the judicial regime, which the latter is based on the ethics of national society (Daniels, 2017). The crisis in the just culture environment refers to the demand for justice linked to the consequences of occurrences; the assessment of behaviour is affected by two biases: outcome bias and hindsight bias (Dekker, 2015; Daniels, 2017; Vink, 2017; Pellegrino, 2019; Read, Shorrock, Walker & Salmon, 2021). Due to knowledge of the outcome of an occurrence, the outcome bias affects judgements about culpability (Dekker, 2015; Daniels, 2017; Vink, 2017). The hindsight bias affects how people, in retrospect, estimate the foreseeability of possible outcomes (Dekker, 2015; Daniels, 2017; Vink, 2017).

On 29. April 2016, the main rotor of the helicopter LN-OJF detached due to a fatigue fracture in the main gear box (AIBN, 2018). All 13 persons on board, sustained fatal injuries on impact with the ground (AIBN, 2018). The Norwegian AIBN published the final report in July 2018 (AIBN, 2018). On the cover page, AIBN reminds the reader of the purpose of AIBNs investigation and their report (AIBN, 2018; p. 1):

> The Accident Investigation Board has compiled this report for the sole purpose of improving flight safety. The object of any investigation is to identify faults or discrepancies which may endanger flight safety, whether or not these are causal factors in the accident, and to make safety recommendations. It is not the Board's task to apportion blame or liability. Use of this report for any other purpose than for flight safety shall be avoided.

Parallel to the AIBNs investigation, the Norwegian prosecutor also investigated the helicopter accident (Politiet, 2018.). In October 2018, the prosecutor decided not to criminally prosecute any person or organisation in connection with the accident (Politiet, 2018.; Eliassen, 2018). The decision not to prosecute was made public through a press release which was published by the Norwegian police (Politiet, 2018). A Norwegian tv-channel interviewed the prosecutor in relation with the decision not to prosecute (Eliassen, 2018). In the interview the prosecutor stated that the cause of the accident has been determined in the AIBNs report (Eliassen, 2018). The prosecutor considered whether it was possible to attribute criminal responsibility or to prove criminal liability (Eliassen, 2018). Based on AIBNs conclusions, the prosecutor explains, it is difficult to establish criminal liability and that is the background to dismiss the case as no criminal offence can be proved (Eliassen, 2018). In the press release, the prosecutor specifies that no

individual person, nor any company has been considered as a suspect or has been criminally charged during the police investigation (Politiet, 2018).

The Regulation requires that personal information in the national database must be disidentified: "Each Member State shall ensure that no personal details are ever recorded in the national database referred to in Article 6(6)." (EU, 2014; p. L122/35). During this research, it was found that some European airlines require 'no history of accidents and incidents', from applicants who apply for a function as a flight crew member, please refer to Appendix A for the screenshot of an example which was published in 2022 (CAE, 2022). The declaration is issued by the competent authority which had issued the flight crew licence of the applicant. As an example, in the Netherlands, such a declaration can be requested by the flight crew member, the airline or competent authority (KIWA, 2022). (Please refer to Appendix B for a screenshot which shows the possibility to request a no incident/ no accident declaration, and to Appendix C for such a declaration, issued by the competent authority of The Netherlands). The information on the declaration suggests that the Dutch authorities, contrary to the provisions of The Regulation, keep a record about the incidents and accidents per licence holder as well as about 'behaviour'.

Just culture at the corporate level

An organization can create a corporate just culture, by principles which define what kind of behaviour is considered as acceptable and not acceptable (Reason, 1997). Reason defines just culture as "an atmosphere of trust in which people are encouraged and even rewarded, for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour" (Reason, 1997; p.195). A just culture policy has to be kept simple and realistic (Licu & van Dam, 2013). Just culture, at corporate level is something that emerges as a result of active organisational work, including reviewing practices, rules and relationships between stakeholders (Kováčá, Licu & Bálint, 2019). The focus of just culture is learning from errors which lays the foundation for fostering collaborative and continuous learning (Allyn, 2019c).

Although Bosk doesn't explicitly apply the term just culture, it can be argued that his work can be considered as a theory of just culture. Bosk argues that fixing the label 'error' to any action is arguable because in two similar cases with identical outcomes, one person can be found 'guilty' and the other one 'not guilty' due to the essentially contested concept of 'error' (Bosk, 2003).

Human Error

Human error is generally identified as playing a central role, or even identified as the cause, of most (aviation) accidents (Snook 2000; Dekker, 2006; Dismukes, Berman & Loukopoulos, 2007; Hollnagel, 2009; Martins, Martins, Soares & da Silva Augusto, 2013; Vink, 2017; Courteney, 2020; Read, Shorrock, Walker & Salmon; 2021). Contrary to the generally accepted view on human error, ICAO argues that "operator error is very rarely the root cause of an occurrence. Usually, some underlying systemic issue is hiding behind it (ICAO, 2021; p. 2-6).

The Definition refers to ‘actions’, ‘omissions’ and ‘decisions. From the context of the terms ‘actions’, ‘omissions’ and ‘decisions’ in The Definition, it is considered justified to apply the collective term ‘human error’ for the purpose of this study (EU, 2014; EC, 2021). The term ‘error’ is not applied in The Regulation.

People have a natural need to attribute causation to somebody else's behaviour; identifying human error as the cause of accident and those who are responsible for the error deserve punishment for their bad behaviour (Reason, 1990; Dekker, 2011; Read, Shorrock, Walker & Salmon; 2021).

Several theories, models, perspectives and concepts have been developed to explain and add understanding of the phenomenon human error, such as the skill, rule - and knowledge model developed by Rasmussen, Reasons taxonomies, 'the old view versus the new view' by Dekker and 'safety 1 versus safety-2' by Hollnagel (Rasmussen 1983; Reason, 1990; Reason, 1997; Woods & Cook, 1999; Reason, 2000 Dekker, 2002; Hollnagel, 2009 ;Vink, 2017; Pellegrino, 2019; Read, Shorrock, Walker & Salmon; 2021).

Several attempts are made to reduce the risk of human error, such as automation, increased supervision, add on procedures and regulations and more (Bainbridge, 1983; Hollnagel & Woods, 2005; Dekker, 2006; Woods, Dekker, Cook, Johannesen & Sarter, 2010; Read, Shorrock, Walker & Salmon; 2021). Eliminating human error by automation creates ironic side effects; In case automation fails, safe operation depends on the performance of humans who were automated away because of their unreliability, also referred to as ‘ironies of automation’ (Bainbridge, 1983; Hollnagel & Woods, 2005).

Reason argues that “The problem human error can be viewed in two ways: the person approach and the system approach” (Reason, 2000; p. 393). A HRO can quickly configurate itself from a routine mode to an emergency situation and vice versa and is characterized by an exceptionally high safety performance (LaPorte & Consolini, 1991; Reason, 2000). HRO is an example of a systems view on human error (Reason, 2000). A, unequivocal, theoretical explanation of the strong safety performance of HROs was not identified during the literature review.

Perceptions around human error and its role in safety have changed over time (Hollnagel, 2002; Vink, 2017; Pellegrino, 2019; Read, Shorrock, Walker & Salmon; 2021). Between 1900 and World War II, the views on human error had its origins in behaviourism and psychophysics, such as Freud's view on unconscious behaviour (Read, Shorrock, Walker & Salmon; 2021). "Errors were used as an objectively observable measure of performance" (Read, Shorrock, Walker & Salmon; 2021; p. 4). During World War II, work on 'human error' was more formalised, inspired by mismatches between design and usability of military equipment such as the design of cockpits; the interaction between the human and technology became the main topic in relation to human error (Read, Shorrock, Walker & Salmon; 2021). Between World War II and the 1980s, cognitive psychology gained strong influence on the view on human error, viewing the human as a rational actor (Read, Shorrock, Walker & Salmon; 2021). Concepts, such as local rationality were introduced (Woods & Cook, 1999; Dekker, 2002; Read, Shorrock, Walker & Salmon; 2021). From the 1980s and onwards, the focus shifted from human error to system induced error in which the phenomenon, which until then was labelled as human error, is not considered as the cause of bad outcomes but as a symptom of systemic shortcomings (Rasmussen, 1982; Rasmussen, 1983; Reason, 1990; Rasmussen, 1997; Woods & Cook, 1999; Dekker, 2002; Dekker, 2006; Read, Shorrock, Walker & Salmon; 2021).

Read, Shorrock, Walker & Salmon distinguish four perspectives on human error: The mechanistic perspective (human error as the cause of accidents, underpinned by engineering principles and Newtonian science), the individual perspective (bad outcomes are due to bad behaviour which can be

mitigated/corrected by training and enforcement; human error is the cause of accidents), the interactionist perspective (human error is the cause of accidents, contributed by contextual factors; contrary to the mechanic perspective and the individual perspective, the view on humans is not negative) and the systems perspective (view on human performance in the context of systems theory and complexity science; accidents are caused by systemic issues and not by 'human error') (Read, Shorrock, Walker & Salmon; 2021).

Stress and high workload have significant impact on human performance, including increased cognitive limitations such as adequate decision-making (Hockey, 1997; Mandrick, Peysakhovich, Rémy, Lepron & Causse, 2016; Kanki, 2018). Cognitive limitations significantly influence the risk that, what is typically identified as, human error emerges (Dekker, 2006; Dismukes, Berman & Loukopoulos, 2007). Loss of cognitive control and subsequently loss of control in flight, has strongly contributed to the emergence of several (fatal) aviation accidents, such as the accidents with Air France flight 447 in the Atlantic Ocean in 2009 (BEA, 2012), the accident with G-BXFI during the Shoreham air show, England, in 2015 (AAIB, 2017) and West Air Sweden flight 294 in Sweden in 2016 (SAIA, 2016). The relevance of the relationship between cognitive impairment, human error and gross negligence is evident from 'the case Andrew Hill'. Andrew Hill was the pilot of G-BXFI (BBC, 2019a; BBC, 2019b; Fieldfisher, 2019). Eleven people lost their lives due to the accident (AAIB, 2017; BBC, 2019a; BBC, 2019b; BBC, 2022; Fieldfisher, 2019). Air Accidents Investigation Branch (AAIB) concluded that the accident was caused by human error because Andrew Hill (the pilot in command) flew too slow (entry to the accident manoeuvre below target speed) and too low (AAIB, 2017; BBC, 2022). Andrew Hill was charged with gross negligence manslaughter because, in the view of the prosecutor, his airmanship had fallen below acceptable standards (BBC, 2019a; BBC, 2019b; Fieldfisher, 2019). Dr. Henry Lupa, defence witness, argued that it was likely that cerebral hypoxia impaired Andrew Hill's judgement and decision making (BBC, 2019a; BBC, 2019b; Fieldfisher, 2019). At the Central Criminal Court of England and Wales (Old Bailey), Andrew Hill was acquitted of gross negligence manslaughter (BBC, 2019b; BBC, 2022; Fieldfisher, 2019).

Errors made by experts are primarily driven by mismatches between task characteristics & environmental events and cognitive limitations and social & organisational factors (Dismukes, Berman & Loukopoulos, 2007). Vink identifies a paradoxical nature of expertise in relation to (human) error because specific errors are made due to expertise (Vink, 2017). Dekker summarizes the essence of the 'experience challenge' related to human error: "experts sometimes fail precisely because they mostly succeed" (Dekker, 2019; p. 81).

Human error is sensitive to misuse and abuse; Human error can be viewed as a cause, a process or outcome and the term human error, from a linguistic point of view, carries negative connotations (Read, Shorrock, Walker & Salmon; 2021). The negative connotations, combined with simplistic explanations of accidents, e.g., under media pressure, have a significant impact on people's need to find a scapegoat who is going to pay for the human error (Hollnagel & Amalberti, 2001; Pellegrino, 2019; Read, Shorrock, Walker & Salmon; 2021).

No consensus on what human error is, was identified during the literature review; "Yet efforts to translate this common attribution into a scientific construct have proven difficult" (Read, Shorrock, Walker & Salmon; 2021; p. 3).

Gross negligence

"The concept of 'gross negligence' is acknowledged by both civil and criminal law" (Pellegrino, 2019; p. 76). For the purpose of this research, only gross negligence in the context of criminal law will be discussed, because The Regulation refers to gross negligence in the context of criminal prosecution. The reviewed literature suggest that the concept causation is applied to determine whether an event, such as human error, has caused another (harmful) event, such as a (fatal) accident (Keiler, 2013; Moore, 2019). Causation is applied differently in national European criminal laws: "The English approach to causation can be described as legal/principled, while the Dutch approach is a legal/normative one and in Germany a two-tiered meta-juridical approach seems prevalent" (Keiler, 2013; p. 121).

Gross negligence in The Regulation

The Regulation does not provide a definition of gross negligence, nor was a common, European, definition of gross negligence identified during this research. Daniels argues that actions which had not been regarded as crimes before the implementation of The Regulation, are criminalised after the implementation of The Regulation because of the use of the term gross negligence in The Definition (Daniels, 2017). Defining gross negligence in The Regulation, as suggested by the EC and the EP, was politically unacceptable for one or more EU-countries (Pellegrino, 2019). Due to the absence of a definition of gross negligence in the normative part of The Regulation, the meaning of gross negligence is indicated in the recitals (Pellegrino, 2019); The definition of gross negligence is implicitly provided in recital 37 and Article 16(10). Recital 37 states (EU, 2014; p. L122/22):

> A 'just culture' should encourage individuals to report safety-related information. It should not, however, absolve individuals of their normal responsibilities. In this context, employees and contracted personnel should not be subject to any prejudice on the basis of information provided pursuant to this Regulation, except in cases of wilful misconduct or where there has been manifest, severe and serious disregard with respect to an obvious risk and profound failure of professional responsibility to take such care as is evidently required in the circumstances causing foreseeable damage to a person or to property, or seriously compromising the level of aviation safety.

The conditions under which the just culture protection rules are not applicable, besides wilful misconduct, are stipulated in Article 16.10(b) of The Regulation (EU, 2014; p. L122/36):

> where there has been a manifest, severe and serious disregard of an obvious risk and profound failure of professional responsibility to take such care as is evidently required in the circumstances,

causing foreseeable damage to a person or property, or which seriously compromises the level of aviation safety.

From recital 37 and Article 16.10(b), it follows that the judgement about how an obvious risk is managed, is directly related to the applicability of the protection rules of The Regulation. Adams argues that "the starting point of any theory of risk must be that everyone willingly takes risks" (Adams, 1995; p. 15). The aetiology of risk changes over time which makes it more difficult to understand risk, due to the inscrutability of the risk mechanisms and the inability of existing risk assessment methods to take sufficient account for the tightly coupled and intractable characteristics of sociotechnical systems (Perrow, 1999; Hollnagel, 2008; Antonsen, 2009).

The word 'obvious' as applied in the term 'obvious risk' in Article16.10(b) has not been specified. It can therefore be argued that what 'obvious' is, depends on 'risk perception'. Perception "refers to the sensory input and is influenced by the physiological processes, expectancy and anticipation" (Glavin, 2011). From the perception of the public, it is known that the risk perception is strongly influenced by the information offered in the mass media (Hawkins, 2017). People's behaviour is highly influenced by risk perception (Siegrist & Árvai, 2020). There is a relationship between risk perception and safety attitude and – behaviour (Rundmo, 1996). National norms and values affect risk attitudes (Frijns, Hubers, Kim, Roh & Xu, 2022). Attitudes are influenced by national culture (Spangenberg et. al., 2003). Possible sources for national differences in risk perception are national differences in values and worldviews, exposure to hazards, optimism bias and perceived risks (Siegrist & Árvai, 2020). Examples of other factors which influence risk perception include age, gender, the outcome of an occurrence, time, cognitive limitations, biases and heuristics, the way information is presented, experience and view on safety (Adams, 1995; Slovic, 2016, Busch, 2016). From the term 'obvious risk', as applied in Article 16.10(b) of The Regulation, it can be argued that a risk assessment is required to determine the acceptability of behaviour of people who have been involved in an occurrence, starts with a risk assessment.

Gross negligence in national penal codes

Different countries, apply gross negligence differently in their national penal codes (Blomsma, 2012; Pellegrino, 2019). Criminal law in Switzerland and Latvia do not apply gross negligence in the context of aviation occurrences (LV, 2021; FCS, 2022).

In England, negligence is defined as "unreasonable conduct which creates an obvious risk of harm or damage through genuine inadvertence" (Loveless, 2016; p. 142). The term 'obvious risk', which is applied in the English definition of negligence, is the same term as used in Article 16.10(b) of The Regulation which describes which kind of behaviour is considered as unacceptable (EU, 2014). Criminal prosecution for gross negligence is only possible in the case of fatal outcomes: Gross negligence is "an extremely high degree of negligence so as to deserve criminal punishment. It only applies to manslaughter" (Loveless, 2016; p 142).

The determination in relation to the application of negligence in the Netherlands is anchored in the principle of Garantenstellung (Blomsma, 2012; Vink, 2017). "'Gross negligence' means, according to Dutch law, a considerable degree of culpable imprudence (insufficient precautions, consciously taking an irresponsible risk, physical and/or psychological unsuitability)" (Bijlsma, 2013, p. 63).

There is a lot of common ground between the legal approach of (gross) negligence in Germany and the legal approach of gross negligence in the Netherlands (Blomsma, 2012). In both countries the application of negligence is referred to the 'Garentenstellung' (Blomsma, 2012). German criminal law distinguishes the same distinction of fault as the Dutch criminal law: Negligence and intent (Blomsma, 2012). Despite a large number of similarities in the application of the Garantenstellung, the jurisprudence points to possible differences in criminal policy; "There is hardly any threshold as to probability in German criminal law. This can be contrasted with the considerable chance in the Netherlands and is perhaps the most important comparative difference to be taken into account" (Blomsma, 2012, p. 105).

Blomsma argues that the criteria for the breach of the duty of care in the Netherlands and in Germany are more elaborate than in England (Blomsma, 2012). "Besides the violation of the duty of care that is causal for a consequence, the actor objectively should and subjectively could have foreseen and avoided this" (Blomsma, 2012, p. 174).

Socio-legal perspective

The development of societal and legal complexities go hand in hand (Vago, 2012). "Accompanying the emergence of laws, court systems, police force, and legislation is a trend toward increasing size, complexity, differentiation, and bureaucratization" (Vago, 2012, p. 71). Law can be considered as a mechanism of social control (Vago, 2012). "Social control refers to the methods used by members of a society to maintain order and to promote predictability of behaviour" (Vago, 2012, p. 194). Baer underlines the need "to understand what law promises, and what it can deliver" (Baer, 2016 p. 213-214). Law comes into play when other forms of social control are weak, ineffective, or unavailable (Vago, 2012).

Two main scientific disciplines perform socio-legal research: Sociology of law and socio-legal studies (Banakar & Travers, 2005).

Griffiths defines sociology of law as "an empirical social science whose subject is social control, that is to say, the social working of rules (primary and secondary), its causes and effects" (Griffith, 2017; p. 121), or, in plain language: "When, why and how do people follow the rules? This is what sociology of law is all about" (Griffiths, 2017; p.97). "The sociology of law receives its intellectual inputs mainly from mainstream sociology and aims to transcend the lawyer's focus on legal rules and legal doctrines" (Banakar & Travers, 2005, p. xi). Cotterrell argues that "the growth of 'legal transnationalism' – that is, the reach of law across nation-state borders and the impact of external political and legal pressures on nation-state law – undermines the main foundations of sociology of law" (Cotterrell, 2009, p. 481). Cotterrell emphazises that (Cotterell, 2009; p. 488):

> Legal transnationalism makes the state's relation to law complex, ambiguous, and variable. It disrupts ideas about law's intellectual unity and hierarchy of authority, confronting legal philosophy's models of legal systems with an untidy, indeterminate legal pluralism. And it disrupts the idea that a uniform relation to the state adequately defines modern law's nature and functions in practical terms.

Social legal studies apply sociology as a tool for data collection (Banakar & Travers, 2005). "Sociological theories seek to explain how the social world operates" (Hirsch, 2015, p. 17).

There is a demand from society to hold someone accountable, and punished, for (fatal) accidents (Trögeler, 2011; Daniels, 2017; Pellegrino, 2019); "It is still the normative ethics of society which determines criminal accountability, and the society of the twenty-first century has drawn very different opinions on criminalisation in shipping and aviation for acts that previously had not been crimes" (Daniels, 2017, p. 26). Woodlock & Hydėn point out that the implementation of The Regulation "represents a prime example of how a 'society' of experts and their specialized knowledge has over time affected and shaped law" (Woodlock & Hydėn, 2020; p.55).

Sociology of law, as a result of transnationalism, needs to reinvent itself and to innovate: "Legal transnationalism should set sociology of law free in the new, still largely unchartered areas beyond the familiar old landmarks of 'law' and 'society'. Legal sociology has to decide for itself how to envisage law today as a social phenomenon" (Cotterell, 2009; p. 500).

In line with Banaker & Travers conclusion about the absence of a strictly specified methodology in performing social-legal research, it can be argued that researchers can benefit from that absence by applying new creative ideas in their research (Banaker & Travers, 2005; p.x):

> Too great concern with following a prescribed method can limit creativity in research by imposing a standard way of investigating law and legal institutions. From this standpoint, the absence of a method text might see to be a good thing: it helps to maintain socio-legal research as a truly interdisciplinary field which is open to theoretical diversity and innovation.

In democratic systems, there is a tendency for policy accumulation which is a reflection of societal modernization and progress in which societal demands result in policy outputs such as laws and regulations (Knill, Steinbacher & Steinebach, 2020). Mismatches in the interactions between policy-formulating bureaucracies (ministerial level) and policy-implementing bureaucracies (implementing bodies and executive agencies) arise if the administrative capacities of the policy-implementing bureaucracies are not increased proportionally with policy accumulation. Policy accumulation undermines policy effectiveness if the created mismatches result in negative trade-offs between policy responsiveness and effectiveness (Knill, Steinbacher

& Steinebach, 2020). A commonly applied measure to mitigate the adverse consequences of policy accumulation is deregulation, but it is the major question whether deregulation is an effective way of dealing with the complexities related to policy accumulation (Adam, Hurka, Knill & Steinebach, 2021). Organisational ambiguities offer the power to interpret in an uncertain world; ambiguities can be viewed as an interpretative lubricant (Best, 2012). Organisational ambiguity "can be understood as one more coping mechanism for organisational actors faced with the unknown" (Best, 2012; p. 101).

Systems thinking, just culture and gross negligence

ICAO defines systems thinking as "an approach to view systems in a holistic, integrated manner, rather than as isolated components or parts." (ICAO, 2021; p. (1-10) "The systems approach argues that the interactions produced by the inevitable complexities and dynamics of imperfect systems are responsible for the production of risk-not a few broken components or flawed individuals" (Dekker, 2017; p. xii).

In sociotechnical systems violations of formal rules and procedures are often inevitable to achieve system goals (Bieder & Bourrier, 2013). Ambiguities and uncertainty have been identified as abstract emergent properties of complex systems; the emergent properties are a result of the interplay between individual system components (Mittal, Diallo & Tolk, 2018; Yilmaz, 2018). Safety is an emergent property of a sociotechnical system (Dekker, 2006; Hollnagel, 2009; Dekker, 2011; Leveson, 2011; Stoop & Dekker, 2012). Increasing complexity of sociotechnical systems is the primary factor for the development of systems thinking (Leveson, 2011). Systems thinking is a way to structure a situation in a complex system (Leveson, 2011). Viewing human error in the context of systems theory and complexity adopts a view of systemic phenomenon such as practical drift (Snook, 2002; Dekker, 2019), local rationality (Woods & Cook, 1999; Woods, Dekker, Cook, Johannesen & Sarter, 2010; Dekker, 2015), drift into failure (Dekker, 2011; Dekker, 2019), normalisation of deviation (Vaughan, 2016; Dekker, 2019), resilience engineering (Hollnagel, Woods & Leveson, 2006; Sutcliffe & Weick, 2015; Dekker, 2019), emergence (Dekker, 2006; Hollnagel, 2009; Hollnagel, 2014, trade-offs (Hollnagel, 2009; Hollnagel, 2014) and equivalence (Hollnagel, 2009; Hollnagel, 2014) into considerations.

Evidence is based on knowledge of the truth about the past and has different meanings for the judiciary (adversary truth, used for fault finding and blame assessment based on post-facto review) and accident investigators (technical truth, used for accident-preventing based on "a priori" projection) (Grose, 2013).

In aviation, unstable approaches have been identified as a significant contributing factor in occurrences and flight crews are expected to execute a missed approach when an approach does not satisfy prescribed criteria (Moriarty & Jarvis, 2014; EC, 2015a; EC, 2015b; IATA, 2017). From a systems perspective, however, phenomenona such as unstable approaches are inevitable due to mismatches in system goals, such as diverging goals for ATCO and flight crews (Moriarty & Jarvis, 2014). Investigations performed by BEA and CAA demonstrate the existence of mismatches between how missed approaches

are executed in the training environment versus missed approaches executed in actual operations (CAA, 2011; BEA, 2013).

From a systems perspective, the reviewed literature provides insights that law, due to complexity, is affected by the many of the same phenomenona as safety such as trade-offs between complexity and manageability (LoPucki, 1997). Viellechner, referring the Euro Crisis, highlights the added value of approaching law from a systems perspective (Viellechner, 2016; p. 759):

> Yet, with regard to the supranational and international instruments that aim to restructure sovereign debt in the euro area, the inclusion of cognitive mechanisms in the normative structure of the law reaches a new dimension that was unknown before. On the one hand, economic imperatives determine the law. On the other hand, fast-changing social circumstances require constant adaptions of the law. Meanwhile, the courts grant a large degree of leeway in regulating the euro crisis to political experiments, if only not to compromise the project of European integration as a whole.

EU-law is profoundly affected by system factors such as multilingualism, multiculturalism, political compromises and the culture of EU-institutions (Baaij, 2015; Bratanić & Lončar, 2015; Robertson, 2015; Bajčić, 2017; van der Jeught, 2018).

Ambiguities, vagueness and indeterminacy are inextricably linked to EU-law (Bratanić & Lončar, 2015; Bajčić, 2017). This is at the expense of legal certainty, including the element legal predictability (Bajčić, 2017). An example of trade-offs made in the development of EU-law is highlighted by Šarčevic: The constant tension between creativity and conformity in which translators and terminologists are caught due to the absence of written rules prescribing strategies for the formation of EU terms (Šarčevic, 2015). Robertson argues that: "The difficulty, however, for the lay reader is that frequently EU legal texts are primarily written for specialists. This is part if EU culture" (Robertson, 2015; p. 36).

Legal certainty in the EU is also challenged by multilingualism and the teleological interpretation of EU-law by the CJEU (Bajčić, 2017). Ambiguities are unavoidable if legal terms do not satisfy the 2 prerequisites of multilingual communication: Harmonized terminology and easy accessibility of terminology (Bratanić & Lončar, 2015). Kjær refers to, The Paradoxical Relationship between Language, Translation and the Autonomy of EU Law (Kjær, 2015; p. 92):

> What we know is that EU texts are drawn up in 24 parallel language versions, none of which has the legal status of an original text, and none of which is designated as a translation. Taken together, they are equally important sources of EU law (Kjær 2007). In spite of this paradoxical relationship

> between the multiple language versions and uniform EU law, we can see that EU law functions and is followed in real life activities in the Member States and that the multilingual rules make sense both inside and outside the confines of the EU institutions. But in theoretical terms we cannot explain why.

Robertson underlines the importance to correctly understand the context of legal terms, which are abstract, and system bound (Robertson, 2015; p. 38):

> The meaning of legal terms derive from their legal context and are specific to the legal system in which they function, although there tends to be broad overlap between culturally related legal systems, as where civil law systems have shared terms from Roman law and common law systems have shared terminology from English law. However, EU law does not really fit these concepts of legal system, because it starts from entirely different positions, namely the operation of markets, competition and international relations.

IRGC defines systemic risk as: "Risks affecting the systems on which society depends (IRGC, 2010; p. 53). "Systemic risks are characterised by complexity, uncertainty and ambiguity" (IRGC, 2010; p. 53). Systems thinking is gaining increasing attention from policymakers (IRGC, 2010; Hoogduin, 2017; Kirman, 2017; Lammersen & da Silva, 2017; Ramos, 2017; Hynes, Lees & Müller, 2020; ICAO, 2021; EASA, 2021c). On the other hand, Hynes, Lees & Müller argue that it is unrealistic to expect a rapid implementation of system thinking in policymaking: "OECD's and IIASA's work in this field has shown that public sector leaders face an uphill battle: there is little clarity on who should promote systems thinking in public organisations and who should assure their capacity" (Hynes, Lees & Müller, 2020; p. 150).

Summary of the literature review

The aim of this summary is to identify possible gaps between this research and existing literature.

As indicated by dos Santos, and confirmed in The Regulation, one of the aims of just culture is to ensure the right balance between flight safety and criminal liability (dos Santos, 2013; EU, 2014). The literature reviewed suggest that there exists a conceptual gap between those two variables; flight safety, through safety science, elaborates on the concept systems thinking, while criminal liability or administration of justice elaborates, through legal science, on the concept causality. As the underlying concepts of both variables differ fundamentally, the question is justified whether both variables can be balanced at all. That question has not been addressed in the reviewed literature and is therefore identified as a gap between this research and existing literature.

Research question

Before defining and explaining the research question, it is desirable to briefly explore the research topic and problem description. The research question consequently emerges from the research topic and the problem description.

The research highlights the complexity related to European (safety) regulations due to cultural factors, a tension field caused by the interactions of sovereignty of national states and the legislative system of the EU, linguistic issues such as the lack of commonly accepted terminology and interactions between academic disciplines. To my knowledge, no previous research has investigated the importance of the above-mentioned factors in relation to just culture.

The research topic is the border between acceptable and blameworthy behaviour which is identified by gross negligence in The Definition. As The Regulation is applicable in all the Member States of the EU, I argue that it is of fundamental importance that there is an unambiguous interpretation of gross negligence in the EU in order to achieve a harmonised protection of reporters and persons mentioned in occurrence reports as referred to in Article 1(b) of The Regulation.

The problem is that The Regulation does not offer a definition of gross negligence, nor does the Regulation offer a clear description of what gross negligence is in the context of The Regulation. The Regulation is enforced by the Member States and the enforcement is based on national penal codes.

The motivation for the research topic is my concern that the tension between EU integration and national sovereignty will hinder harmonised protection of reporters and other people who are involved in aviation occurrences.

Hence, the research question is: Is there a common European understanding of ‘gross negligence’ as cited in the definition of 'just culture' in Regulation (EU) 376/2014?

Methodology

The purpose of this research was to determine whether there is a common interpretation and application of the term gross negligence, in the context of The Regulation. It was important to find out how stakeholders experience gross negligence from their professional experience. The input from the informants was crucial for the success of this research. The context of the information provided by the informants was essential for a correct understanding of their input.

The choice of determining the selection of a research methodology, adopted the following criteria:

- The selected methodology is suitable for answering the research question
- It has to fit/match the characteristics of the area which is researched
- The methodology has to be able to help the researcher in managing restrictions on access to data

As it was the aim to explore experiences, interpretations, and expectations of the informants, I selected a qualitative approach methodology. The main considerations for this choice were that "qualitative research explores attitudes, behaviour and experiences" (Dawson, 2009, p. 21) and that "Qualitative research intends to approach the world 'out there' and to understand, describe and sometimes explain social phenomena 'from the inside' in a number of different ways" (Gibbs, 2007, p.8).

In an early stage of the brainstorming for the research, it became clear that the selection of only a qualitative research methodology was too limited; it needed more specificity. Although the development of a complete theory goes beyond the scope of this research, I choose to make use of the structure in which theory is generated by data, obtained through literature and interviews.

For a further specification of the qualitative research, I considered the following approaches to the research: Narrative research, phenomenological research, case study research, ethnographic research and grounded theory research.

Narrative research builds on the individual experience of people (Creswell & Poth, 2018). In the context of this research, the individual experience people have with just culture is relevant in relation to a broader understanding of how people experience gross negligence. The research focus of a narrative

research is to explore the life of an individual (Creswell & Poth, 2018). As I did not explore the life of an individual, I did not consider a narrative research methodology as suitable for this research.

Phenomenological research is based on phenomenology. "Phenomenology is a philosophical approach for the study of experience" (Smith, Flowers & Larkin, 2009, p.16). Phenomenology helps the researcher to understand the experience of the participants subjective reality and aims to understand meanings and actions (Thompson & Walker, 1998). "A phenomenological study describes the common meaning of several individuals of their lived experiences of a concept or a phenomenon" (Creswell & Poth, 2018, p. 75). As I try to identify relevant themes which emerge through data analysis of interviews, a phenomenological approach was not selected for this research.

The research focus of a case study approach is "to develop an in-depth description and analysis of a case of multiple cases" (Creswell and Poth, 2018, p.104). In my opinion, a case study approach is suitable to, for example, study the "just culture" approach of one or more specific occurrences. As I did not focus on the understanding of one or more specific cases, I did not consider a case study as a suitable method for this research.

Ethnographic research aims to study cultures by understanding the daily life of a specific group (Creswell & Poth, 2018). An important element of an ethnographic research is that the researcher becomes part of the everyday life of the group which is studied (Creswell & Poth, 2018). An ethnographic approach was not selected as interviews was chosen as the tool to collect data for this research.

Grounded theory applies "methods such as focus groups and interviews tend to be preferred data collection method, along with a comprehensive literature review which takes place throughout the data collection process. This literature review helps to explain emerging results" (Dawson, 2009, p.18). As there is very limited scientific information available about just culture, and in particular about gross negligence in the context of The Regulation, it was not an option to build the structure of my research around an existing theory. It was important to understand how stakeholders experience gross negligence in the context of The Regulation. By using grounded theory, a researcher can generate a theory which is grounded in the data emerging from interviews and literature review (Dawson, 2009). "Grounded theory is a qualitative research design in which the inquirer generates a general explanation (a theory) of a process, an action, or an

interaction shaped by the views of a large number of participants" (Creswell & Poth, 2018, p.82). Creswell & Poth point out that (Creswell & Poth, 2018; p.84):

> The data and analysis procedures are considered to undertaken simultaneously and iteratively. The primary form of data collection is often interviewing in which the grounded theory researcher is constantly comparing data gleaned from participants with ideas about the emerging theory. The process consists of going back and forth between the participants, gathering new interviews, and then returning to the evolving theory to fill the gaps and to elaborate on how it works.

"The intent of grounded theory study is to move beyond description and to generate or discover a theory" (Creswell & Poth, 2018, p. 82). Although this research does not aim to generate a scientific theory but to answer a research question, it does not mean that grounded theory cannot be considered as a suitable research method for this research. The exact context of the word 'theory' might need some more explanation. In grounded theory, "the intersections of the categories becomes the theory" (Creswell & Poth, 2018, p.84). The theory emerges during the selective coding process. Theory is defined as "an explanation of something or an understanding that the researcher develops" (Creswell & Poth, 2018, p.84). Grounded theory offers the scientific possibilities and flexibility which I felt that I needed for this research. Examples are: Flexibility in the number of informants during the design and execution of the research, as well as an interaction between literature review and the data collection and interpretation (Dawson, 2009). Grounded theory is an accepted research method in social sciences, like sociology (Creswell & Poth, 2018), which I consider as beneficial in relation to the research question. "Grounded theory is a good design to use when a theory is not available to explain or understand a process" (Creswell & Poth, 2018, p. 87). "Grounded theory, like ethnography, uses the inductive approach (which relies on observations to develop understandings, processes, laws and protocols) and ultimately aims for construction of substantive and formal theory" (Grbich, 2013, p. 80).

For this research, I selected and drew upon one of the three main versions of grounded theory: Straussian, Glaserian and Charmaz's version of grounded theory (Grbich, 2013). "The Straussian approach has a focus on fragmentation of data through a three-stage coding process" (Gbrich, 2013, p. 79).

Data collection

I considered interviews as the most appropriate means of data collection as "The qualitative interview provides an opportunity for the researcher to listen to the views of experiences of one respondent for an extended period of time and to ask probing questions to explore ideas further" (Harding, 2013, p.34). Dawson distinguishes three types of interviews: Unstructured interviews, structured interviews and semi-structured structured interviews (Dawson, 2009).

By performing an unstructured interview, the researcher aims to get a holistic understanding of the informant's point of view and/or understanding. The researcher asks as few questions as possible and lets the informant talk as much as possible. (Dawson, 2009). A disadvantage of the unstructured interview method, in this research, was that I might be faced with a lot of irrelevant and unusable data (Dawson, 2009). I did not consider unstructured interviews as an appropriate research method for my research because I tried to receive specific information about the informant's experience related to the implementation of The Regulation.

Structured interviews are mainly used for quantitative research; the researcher asks the same questions to all informants and usually ticks the answers on a form (Dawson, 2009). As I need to understand the interpretation and experience of my informant, I considered structured interviewed as unsuitable for my research.

By using a semi-structured interview, the researcher can ask the informants the same questions which enables the comparison of the answers the informants provided (Dawson, 2009). On the other hand, the researcher also has the flexibility to ask more in-depth questions which are relevant in relation to each informant. Semi-structured interviews offer a researcher the possibility to balance between a structured and a flexible approach. For this research, I considered semi-structured interviews as the most appropriate interview technique as I was able to adjust the questions to the informant's background and experience, e.g., independent experts without aviation experience, versus aviation professionals from the industry and

aviation regulators. Other considerations to select semi-structured interviews as the main interview technique include Informants have the opportunity to tell their own story/experience and to speak freely withing the time constraints and the scope of the interview, in depth personal discussions are possible but not required and the researcher has "the possibility to modify initial questions in the light of participants' responses" (Smiths, Flowers & Larkin, 2009, p.63).

The interviews were conducted face to face in order to be able to catch both verbal and non-verbal signals. I planned to conduct the interviews at the office of the participants or on a neutral place like a hotel. The interviews were conducted in English, Norwegian and Dutch. The perspectives, including statements, which are referred to in this chapter were translated into English if the interviews were conducted in Norwegian or Dutch.

The interviews with the respondents were transcribed as soon as possible after the interviews had been conducted. A respondent is defined as "someone who contributes data to a research project" (Harding, 2013, p.18). I read the transcripts several times to get an initial impression of the data which emerged from the transcripts. Thereafter, the transcripts were divided into sections in relation to their relevance to my research objectives. Based on the sections, I wrote a summary of each transcript. The summaries of the transcripts were compared in order to identify an initial impression of similarities and differences. For me, this approach offered me an opportunity to start with comparing 2 interviews and gradually develop a more sophisticated impression of the data which emerged from all the interviews of this research. By following this technique, which was inspired by the constant comparative analysis (Harding, 2013), it was possible to handle the large amount of information in a structured manner and maintaining an overview of the analysing process. The data was coded after the initial review. The coding process is discussed in the next chapters. After the coding process, the data was analysed by theme (Thematic analysis).

Data validity

In research, "asking the wrong questions actually is the source of most validity errors" (Kirk & Miller, 1986, p.25). Asking the right questions, to increase the validity of my data sources, was a major point of attention during the preparations of the interviews. Particularly the first 2-3 interviews had a high degree of 'learning by doing'. This was a main challenge in relation to 'asking the right questions' as the interviews were performed as semi-structured interviews. Some questions were discussed with my supervisor before the first interviews took place. One of the main characteristics of semi-structured interviews, which were

used during this research, is the component flexibility. During the interviews, new questions arose as part of the interaction between the researcher and the informant.

I listened to the recordings of the first 3 interviews several times before the fourth and fifth interview were conducted. The relistening served two main purposes.

First of all, I was looking for ways in which I could improve my role as an interviewer. One of the main learning points during the first interviews was that I talked too much. During the subsequent interviews, I tried to reserve more and more room for the informants to tell their story, a technique which proved to be successful. The success was measured by the number of new open codes which emerged during the subsequent interviews. In hindsight, I claim that it would have been possible to get more open coding out of the first interviews if I had handled these interviews in the same ways as I did during the last three interviews.

The second purpose of relistening to the recording, in relation to validity, was to get an impression of the gap between intended interviews during the design of the research and the actual interviews as they took place. The main elements which were considered were whether I asked the questions which I intended to ask based on the interview guide, how I managed moments of silence and how the interaction between informant and researcher took place with particular attention to follow-up questions and new issues addressed by the informants.

During three interviews, no recordings took place. In order to achieve an acceptable level of validity of these interviews, I made notes during the interviews and wrote a report immediately after those interviews took place. Although there is no doubt that I missed data as a direct consequence of the absence of a recording, I consider that the main features of the interviews were written down correctly and subsequently coded.

I was the only researcher who carried out both the interviews and the analysis. I believe that that element was addressed by the preparation, and evaluation, of the interviews. One example is the time which I used to evaluate the first three interviews before continuing with the rest. The time required for those interim reviews, was significantly more than expected and created a new time constraint for the research. As I felt that I needed these evaluations, I decided to take the time for them and accepting the delay of my thesis. In doing so, I avoided or at least minimized, a reduction of the validity of my research.

I had to compensate for my own experience with just culture which could have created an unconscious bias. As I have been involved with the implementation of The Regulation on behalf of my employer, I had to be particularly alert to avoid mixing my role as a civil servant working with just culture and my role as a researcher, writing a thesis about how stakeholders experience gross negligence. Throughout the research, I reminded myself several times of my position. I tried to 'stay to the facts' as close as possible, being well aware of the fact that my personal biases, values and experiences might influence my interpretation of the data provided during the literature review and the interviews.

Harding claims that "One particularly important concept associated with enhancing the validity of qualitative research is reflexivity" (Harding, 2013, p. 18).

Reflexivity of my own personal position, opinions and values was a valuable tool to compensate for all the elements which might put the validity of the research under pressure.

As argued by (Creswell & Poth, 2018, p. 228):

How we write is a reflection of our own interpretation based on the cultural, social, gender, class, and personal politics that we bring to the research. All writing is "positioned" and within a stance. All researchers shape the writing that emerges, and qualitative researchers need to accept this interpretation and be open about it in their writings.

Data analysis

Coding was selected for the analysis of interview data. The coding process consists of three steps: Open coding, axial coding and selective coding.

The selected research method offered a tool which was useful to understand, and compare, the information provided by informants. The "research methods should fit the actual characteristics of the social process being studied" (Banaker & Travers, 2005, p. 122).

I had to be able to compare the data which emerged from the interviews and identify and discuss themes which could then be used. The chosen research method had to enable a combination of 2 methods of analysis: Constant comparative analysis and thematic analysis. Comparative analysis is a technique where "data from different people is compared and contrasted and the process continues until the researcher is satisfied that no new issues area rising" (Dawson, 2009, p.81). Constant comparative analysis took place during the open coding process and was an important tool to conclude whether data saturation had been achieved or not. Saturation is defined as "an awareness that no new information is emerging" (Grbich, 2013, p. 82).

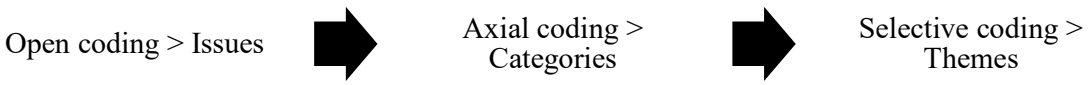
The foundation of the answer to the research question becomes visible in the data due to patterns that emerge during the analyses. The purpose of open coding is to enable a further analysis of the data (Harding, 2013). The text of the transcripts is examined in accordance with the constant comparative and constantly compared with each other. During the open coding process, the data is coded for its major issues. I identified issues directly related the respondents experience with gross negligence. Initial dimensions of data were identified, and the codes were handwritten alongside the printouts of the transcripts or the interview reports in those cases in which the interviews were not recorded. The initial data dimensions were used to identify issues. An issue is defined as "a specific question of subject to be examined" (Harding, 2013). The issues identified during the open coding phase, were used as a basis for further analysis. During the research, the number of new codes which emerged during every new interview decreased. The decrease of new data which emerged during the last interviews is referred to as data saturation (Harding, 2013). In

this research, data saturation was confirmed when no more new codes emerged during the last interview. The codes which were generated during the open coding process, were used as a starting point for identifying concepts and categories in the next coding phase. The issues were identified without reference to an already existing theory.

Constant comparative analysis is a technique where "data from different people is compared and contrasted and the process continues until the researcher is satisfied that no new issues area rising" (Dawson, 2009, p.81). Comparative analysis took place during the open coding process and was an important tool to conclude whether data saturation had been achieved or not. The issues which emerged from the open coding phases were used to identify concepts and categories. A concept is "an underlying idea that is not necessarily referred to directly by the respondents" (Harding, 2013, p.17). A category is "a heading under which different sections of data can be placed for the purpose of analysis" (Harding, 2013, p.17).

During the axial coding process, codes emerging from the open coding process were related to each other by identifying similarities and differences. Axial coding interconnects the categories (Creswell and Poth, 2018) and offers the base for the final step in the coding process: Selective coding.

The aim of selective coding is to identify themes, which are anchored in the data emerging from the open coding and the axial coding processes. A theme can be described as "an idea that can be seen running through several responses" (Harding, 2013, p.17) or "a recurring thread or pattern that the author finds *in* the data" (McGregor, 2019; p.359).



Thematic analysis means that "data is analysed by theme" (Dawson, 2009, p.80). Thematic analysis took place after the selective coding and was used as an input for the discussion.

A Selection of documents which were considered to provide data of significant importance for this research, were analysed during the document analysis. In a document analysis, documents are used as a data source for the purpose of a second-order analysis (Shkedi, 2004; Gross, 2018). A second-order analysis is as a method to construct theoretical explanations of the research question (Shkedi, 2004; Gross, 2018).

The foundation of the answer to the research question becomes visible in the data due to patterns that emerge during the analyses. In the chapter 'discussion', I share my reflection and my interpretation of the data. "The discussion section is the heart of the paper" (McGregor, 2019; p.419). The discussion serves three key functions: Summarize key findings, explain the findings, and examine implications of the findings (McGregor, 2019).

Ethical considerations

In addition to legal requirements for research, every researcher has a personal responsibility to exercise due care to ensure that the research is in conformance with ethical criteria such as integrity, informed consent, confidentiality, transparency/open communication, impartiality and independence, awareness of human dignity, objectivity and public confidence. The Swedish Research Council distinguishes between the law and morals in relation to good research practice (Swedish Research Council, 2017). The researcher must find the right balance between the criterion of protection of the individual and the research criterion (Swedish Research Council, 2017).

I did not find an exhaustive, complete, (check)list with all ethical considerations/principles a researcher must comply with. I have concluded that it is a matter of common sense that it is impossible to expect that such a (check)list exists. "It cannot be said that these principles are each one clearly defined. But together they create a multi-dimensional moral space within which the researcher shall work – they stake out the borders for what can be regarded as good research practice" (Swedish Research Council, 2017; p.69).

Apart from of legal requirements which describe ethical standards for research, it is the researchers own view on research-ethics which plays a decisive role in the process to ensure that the research fulfils both legal requirements and ethical (moral) criteria.

This research would not have been possible without the participation of the interviewees. Participation in this research was voluntary. Interviewees were informed about the purpose of the research and how the information they provided during the interviews was used. Confidentiality and anonymity are ensured as recordings of interviews, where applicable, were deleted after (open) coding was completed. The participants are coded. The participant codes were only available for my supervisor and me. The interviewees, nor the organisations they work for, are traceable in the document. The data, which emerged through the interviews, is anonymised, minimising the risk of harm and/or discomfort to interviewees and the organisations they work for.

This research was performed for academic purposes only. External funding is not applicable. I have no commercial- or other interests in this research. Hence, I conclude that the risk of 'conflict of interest' is negligible. The conclusions of this research are not set in stone. I am more than happy to discuss other views and to share my approach with other researchers. As a research community we can only achieve

progress when we all aim to share our knowledge and experience. That requires strong will to continually reflect critically on our own work, also after it has been approved. Research which has been published is a starting point, not a final stop.

Ethical permission is not required for this research because the research does not fulfil any of the conditions specified in the Swedish Act Concerning the Ethical Review of Research Involving Humans.

To the best of my knowledge, I certify that this research complies with the requirements for the researcher as specified in the Swedish 'Act on Responsibility for Good Research Practice and the Examination of Research Misconduct' (2019:504), as well as with general ethical criteria.

Findings

Introduction

The aim of this chapter is to present the main findings of the interviews and document analysis. The findings of the literature review, interview data and document analysis are used as the basis for the chapter's 'discussion' and 'conclusion'.

A total of seventeen informants, of which eight jurists, contributed to this research during eleven interviews. Most interviews were performed on a one-on-one basis. Three interviews were performed with multiple informants: Interview C (with informant 3 & 4), interview F (with informant 7, 8, 9 & 10) and interview K with informant (15, 16 & 17). The eight informants who work for (national) aviation authorities, four jurists and four safety experts, represent five different European countries.

The description of the informants refers to their situation when the interviews were performed. The contributions of the informants, with the exception of informant 2 & 6, represent the social legal dimension of this research because they explain how gross negligence is experienced by the people who are affected by The Regulation from three different perspectives: The aviation industry, representatives of employees working in the aviation industry and the aviation authorities. Informant 2 & 6 both hold a PhD in legal science but are not employed in the aviation sector; their views are invaluable because of their extensive knowledge of (European) law, including their expertise in relation to negligence. Please refer to Appendix D for a more detailed overview of the informants.

Interview findings

In the following section, different perspectives of the views shared by informants are presented in order to give insight in what was found in the data provided by the informants. The information from the transcripts are paraphrased, unless specified as quotations.

Analysis of the interviews by theme

The purpose of this subchapter is to give an initial view of the information which was shared by the informants. The information is structured by the themes which emerged as a result of selective coding: Safety, judiciary, bureaucracy, EU-integration, public opinion, trust and just culture.

At first sight, the impression can be given that the informants during the first interviews provided more information than the informants during the latter interviews. The fact that the latter interviews provided less new information is, in my view, a confirmation of data-saturation; at a point during the research, no, or very little, new information emerged from the interviews. Another aspect which must be taken into account is that some informants were more forthcoming than others; when asking one question, some informants spontaneously provided their interpretation of a question including very valuable information in relation to the research question. I consider that this aspect to be a conformation that semi-structured interviews were the most suitable interview-technique for this research.

Theme 1: Safety

As a safety manager at an ANSP, informant 1, expects that an expert does not always follow all the rules. Although it is undesirable, it is unavoidable. In the operational manual only rules and procedures are described, which are considered as required by the organisation. The primary purpose of the rules and procedures is safety. You can argue that if you haven't done anything wrong, that you have nothing to fear. But informant 1 is not so sure about that because it is uncertain whether the judge understands the case. In the aftermath of an event, you will find what you are looking for, highlights informant 1.

The ANSP which employs informant 1 views just culture, including gross negligence, through a systems approach; In the case of occurrences, organisational issues are investigated: the case is initially considered as system induced. Any follow-up is based on the starting point that decisions made by employees made sense to them and that the organisation can learn from it. How has the person been trained? Who put him/her in the position? Informant 1 explains that the organisation constantly reviews its own rules and procedures and reflects whether the written rules and procedures really describe what the ANSP means and wants to achieve.

Informant 1 questions what the legitimisation is to judge decisions made by the employees, given the complexity and dynamic characteristics of everyday work. Pilots, ATCO and maintenance, they are all highly professional people working in a professional environment. The design of the infrastructure is an example of a systemic issue which must be considered in case of a just culture procedure, such as large airports with high traffic volumes, crossing runways, noise abatement procedures etc. etc., informant 1 says. In the view of informant 1, the management bears a major responsibility and accountability to ensure that employees can work in an environment which facilitates that they are able to work in alignment with the company's standards and expectations. In the view of informant 1, prosecution of corporate managers instead of individual frontline operators is viewed as a good development in the case of systemic accidents.

Informant 1 highlights that in the company documentation, ATCOs are reminded that they must deviate from procedures if it is in the interest of safety. The challenge is that the person who judges whether a deviation from standard rules and procedures is in the interest of safety, must be able to understand the ATCO. These judgements can only be done after the event. It can be questioned whether a judge understands the case of an ATCO very well because a court case is influenced by at least three different perspectives: The judge's perspective, the corporate perspective, and the perspective of the ATCO. All three actors have their own view on rules, procedures, and safety, informant 1 underlines.

The arguments of informant 1 are also put forward by both legal experts who are not employed in the aviation sector (informant 2 and informant 6). Informant 2 highlights that The Regulation, including the term gross negligence, is only applicable in relation to safety. There is a certain tension field between safety and accountability. Informant 6 argues that the prosecutor and the judge must be able to have a practical understanding of an occurrence.

As representatives of a national union for airline pilots, informants 3 and 4, share the view that the starting point of an investigation is the safety investigation only. The judicial investigation is only applicable

in exceptional cases. The safety expert looks at 'why' something happened. The prosecutor looks at 'who' and 'what', cause and proxima', who is closest to the error? Events can create exculpations.

Informant 6 points out that the judiciary in the Netherlands increasingly applies a systems view. Informant 6 illustrates that development with the example that criminal) accountability of bad outcomes is placed to a greater degree on the management of an organisation than on the level of the frontline operator, such as was the case with a fire at Chemie-Pack BV in 2011 (Vink, 2017). "Despite the fact that it was obvious that an employee caused the fire actively, the prosecution decided not to consider them a suspect. Instead, the prosecution aimed its investigation at the legal department of Chemie-Pack BV and its managers" (Vink, 2017; p. 164).

The complexity related to the collection of safety data and - information must not be underestimated (informant 12). The taxonomy which is used to collect and analyse safety information is far too complicated. The taxonomy is not suitable for the follow up of occurrences in the day-to-day operation. It can be questioned what an organisation can do with 'a tsunami of data' and how that safety data relates to just culture and gross negligence.

In just culture, safety science and law overlap each other, informant 13 highlights. Both domains must weigh as closely as possible against each other. Informant 13 argues that there is no hierarchy between safety and the administration of justice. Informant 13 underlines that the function of criminal law must be approached in relation to societal developments.

Based on the interview transcripts, 6 key findings with regard to the theme 'safety' were identified:

- The first key finding refers to the tension field between safety and accountability as raised by informants 1, 2, 3, 4, 6, 12 and 13.
- The second key finding was raised by informant 1; to ensure safety, there is an inevitable gap between formal rules and procedures versus the daily operation.
- The third key finding refers to the competence of the people who are judging the decisions made by frontline-operators; it related to the question of whether prosecutors and judges have sufficient competence to understand an occurrence and the decisions made by experts.
- The fourth key finding refers to three different perspectives of an occurrence during a trial, as highlighted by informant 1: The perspectives of the ATCO, ANSP and the perspective of the judge.
- The fifth key finding refers to the approach to an occurrence as raised by informant 3 and 4: Safety experts ask 'why' something happened, versus the prosecutor who asks 'who' and 'what' in the context of cause and proxima'.

- The sixth key finding refers to an increased application of a systems view by the judiciary, as addressed by informant 6.

Theme 2: Judiciary

"From the view of the principle of legality, it is very important to exactly know what gross negligence means" (quotation from informant 6, statement translated from Dutch). It, therefore, is of vital importance to have an overarching term in an EU-Regulation. The application of negligence differs from country to country. Most countries distinguish between intent versus fault, but it is not the same. Intent and fault are explained and applied in every country through jurisprudence, and the boundaries are defined by judges. In the context of The Regulation, prosecution is only possible in cases in which a high safety risk has been knowingly taken. Gross negligence is not defined in The Regulation. Looking at the text of The Regulation, gross negligence would have been classified as conscious recklessness and not as gross negligence in the Netherlands. Conscious recklessness is more severe than gross negligence. After an occurrence, the safety investigators look at the system and the juridical investigators look at the consequences, informant 6 explains.

Informant 6 also emphasises that 'intent' and 'fault' become more and more complex terms from a legal point of view. The Dutch penal code was developed in the beginning of the industrial revolution. Society has become much more complex since then, but we still have to deal with the penal code. You can say that the penal code is a little behind the developments in society. There is a special maritime court in Hamburg which deals with international cases. Maybe a special 'aviation court' can be beneficial for aviation because of the international character of aviation and the complexity of aviation cases. It is a real challenge to get the right expertise in the national justice system.

The suggestion that an international aviation court can be useful is supported by informant 12. It can be one of the possible ways to achieve a common understanding of gross negligence. An international just culture committee, or arbitrage committee, can be a next step in the development of a common understanding, and application, of gross negligence (informant 11).

There is a need for an overarching term of what gross negligence is (informant 1). Gross negligence is applied differently in every organisation and on Member State level. 'The red line', which is the boundary between acceptable and unacceptable behaviour, does not exist. It only exists after a verdict by a CEO or a judge. The Regulation is a political document. Informant 1 also raised the issue that retributive justice is considered as 'just' in one place, but not in another.

Informant 5 emphasizes that the application of gross negligence is determined by the teleological approach of gross negligence; the prosecutor and court consider the intention of the application of gross negligence in the criminal law.

Informant 11 argues that gross negligence is a problem. Gross negligence does not exist in the penal code of several European countries. In the view of informant 11, gross negligence creates more problems

than it solves. From the perspective of legal certainty, it is not fair to apply a term which does not exist in the criminal law of countries in which The Regulation is applicable. Informant 11 argues that one of the problems is that prosecutors, in countries which do not apply gross negligence in their criminal law, will use the term closest to gross negligence as the threshold for prosecution: Negligence. In those cases, gross negligence is a concept nobody knows what to do with, informant 11 highlights.

Informant 13 argues that the EU made a mistake by applying a corporate definition of just culture, including the term gross negligence, in The Regulation. The definition is relevant to criminal law, but the definition is misplaced in a corporate regulation. Policy makers did not really understand the consequences of copying a corporate definition in The Regulation: as a result, a corporate definition became part of the legal order of the EU.

The function of the prosecutor is recognized by the definition of just culture, informant 13 highlights. Informant 13 clarifies that some Member States did not accept that the EU defined gross negligence because the application of the penal code is a national issue of the Member States. The (national) penal code is an integral part of national sovereignty. The definition which was suggested by the EC in the drafting phase of The Regulation, was removed from Article 2 (definitions), and subsequently returned, in Article 16.10 (when protection rules are not applicable).

Informant 13 argues that, for prosecution, Article 16.10 is more restrictive than the definition of just culture'. But you end up with every national interpretation of gross negligence, informant 13 explains. Some countries apply intention as a threshold for prosecution. In at least one European country, a cumulation of behaviour might be considered as gross negligence. On the first occasion, the error is not considered as gross negligence, but on a second occasion, it might be possible that the same error by the same person is prosecuted as gross negligence. Informant 13 clarifies that just culture does not offer a solution for everything, but it is a significant improvement in relation to the situation before the implementation of The Regulation when just culture had not yet entered the legal order of the EU.

Informant 15 observes that it is unsure whether a national court will refrain from prosecution in cases with a lower degree of culpability than gross negligence, for example negligence. It is possible that a court will argue that, based on the principle of equality, it is unfair that people in the aviation sector are not prosecuted for negligence, while other people cannot benefit from that additional protection provided by The Regulation, informant 15 explains.

There was no consensus between informants who work as safety experts for the four different national aviation authorities, informants 7, 8, 9 and 10, whether the description of circumstances when protection rules are not applicable (Article 16.10) can be considered as a definition or description of gross negligence. Two of the informants agreed with the statement that gross negligence is defined in Article 16.10, but the remaining informants were unsure. None of the national aviation authorities for which the safety experts work, publish a definition/description of gross negligence. Informant 7 works for the aviation authorities of a Member State which does not apply the term gross negligence in the penal code.

(Gross) negligence can not only be approached from a corporate view or from the perspective of the penal code, but also from the view of civil law (informant 2, 5 & 6).

Based on the interview transcripts, 10 key findings were identified with regard to the theme 'judiciary':

- The first key finding refers to importance to exactly know what is meant with gross negligence in the context of The Regulation, as addressed by informant 6.
- The second key finding refers to the different national applications of gross negligence in criminal law as addressed by informants 1, 6, 11, 12 and 13.
- The third key finding was addressed by informant 6 and refers to the phenomenon that criminal law is lagging behind with developments in society.
- The fourth key finding refers to the increased complexity of fault and intent, as mentioned by informant 6.
- The fifth key finding was raised by informant 6 who argues that it is a huge challenge to recruit the right expertise in the national justice system and therefore suggests considering the establishment of an international aviation court.
- The sixth key finding refers to the absence of gross negligence in national penal codes, as mentioned by informant 11.
- The seventh key finding was addressed by informant 5 who points out that there is a difference between a literal approach of gross negligence as described in law and the teleological approach of gross negligence.
- The eighth key finding was raised by informant 15 who expressed to be unsure whether the threshold for conviction, in the context of The Regulation, is gross negligence as specified in national law.
- The nineth key finding was raised by informant 13 who explains the absence of a definition in The Regulation was the result of a political compromise.
- The tenth key finding refers to possibility to approach of gross negligence from different perspectives: Criminal law, civil law and the corporate view on gross negligence as mentioned by informant 2, 5 and 6.

Theme 3: Bureaucracy

"Article 16 is fuzzy. What are we looking at? The risk perception of an individual? Article 16 is a political compromise. No real definitions, that is cleverly done" (informant 11).

Informant 11 argues that at the corporate level, the term gross negligence is directly subjective. The job of a CEO is different than the job of a regulator or safety investigator. At the corporate level, gross negligence becomes very attractive because you can look for someone who is going to pay for the error. The Definition is a corporate definition, which became part of The Regulation, and The Regulation does not offer clear definitions/descriptions of terms such as 'obvious risk'. Instead of letting the judiciary 'draw the line', it can be done at the corporate level.

Informant 11 underlines the reality that The Regulation obliges organisations to judge. We now risk that people without (technical) knowledge will judge technical errors, informant 11 clarifies. The Regulation says a lot about the accountability of frontline operators, but nothing about the accountability of the management who is judging the frontline operator. There is a real risk that incompetent people are judging others, based on The Regulation. For the judiciary, gross negligence can be ok, but on corporate level, informant 11 expects that there will be 'bad cases' (informant 11).

Informants 3 and 4 recognize the challenge identified by informant 11, but identify that the (juridic) authorities, the aviation sector and the unions in the country they work in, have made adequate arrangements to handle this tension field. In this particular country, an employee who is sanctioned by the employer can have the case reviewed/tested by the court. For such a system to work properly, it is crucial that the judiciary, companies and representatives of employees have regular consultation and continuously work on strengthening the mutual trust.

Informant 6 noted that investigation reports are used by the judiciary, despite the clear intention not to do so. Informant 6 also argued that it is virtually impossible to be able to prove that a prosecutor or judge uses an investigation report for the purpose of legal proceedings. One of the problems is that nobody can delete the information from the brain after having read an investigation report, informant 6 emphasized. Informant 6 suggested to critically check the date a prosecutor publishes the decision whether to prosecute or not, and to compare the date of the publication with the date of publication of a report published by the investigation board. Informant 6 notes that the date published by the judiciary, remarkably often, is later than the date of publication by the investigation board.

As a safety manager of an European airline, which outsources a part of the production to other European airlines, informant 14 identifies the different use of gross negligence at the corporate level might impact (legal) certainty, due to different applications of just culture and gross negligence between the airline and subcontractors It is an issue which has to be negotiated with the subcontractors. But it is a bureaucratic challenge because the subcontractors are foreign carriers, and the national law of the operator is applicable to their flight crews. Informant 14 explains that different national views, based on different penal codes, complicate the application of gross negligence in international flight operations.

Informants 7,8,9 and 10 agree that inspectors working for the national aviation regulators have not been adequately prepared to audit internal 'just culture' policies. They all share their feeling that the inspectors do not really know what to look for, other than checking whether an organisation has implemented just culture (informant 7, 8, 9 & 10).

Informant 12 argues that The Regulation has been drafted in an unfortunate way. The taxonomy of occurrence reports is far too complex for minor occurrences which are the subject of mandatory occurrence reporting. This causes new bureaucratic challenges. It is unknown how you can enforce The Regulation during an audit. As a result, the ultimate test of The Regulation will end up in a court of law (informant 12).

It must be very clear that the corporate 'just culture' is subordinate to the national just culture; It is impossible that specific behaviour is acceptable on corporate level and that the same behaviour is considered as not acceptable in the context of the national just culture (informant 13).

Based on the interview transcripts, 7 key findings were identified with regard to the theme 'bureaucracy':

- The first key finding was provided by informant 11 and refers to ambiguities in The Regulation; the Regulation does not provide clear definitions about gross negligence and 'obvious risk' so that both terms can be interpreted in different ways.
- The second key finding refers to 'a deregulation of justice'; informant 11 underlines that The Regulation oblige organisations to judge.
- The third key finding also refers to information provided by informant 11: People, without relevant competence, are given a tool to judge employees; The Regulation does not say anything about required competence of the people who judge, nor does The Regulation say anything accountability of managers.
- The fourth key finding of the theme 'bureaucracy' was provided by informants 3 and 4 and refers to the importance of a structured dialogue between employees, organisations and the judiciary about the practical implementation of just culture.
- The fifth key finding refers to the competing discourse between the role of the investigation board versus the role of the judiciary; On the one hand states promote that investigation reports are not to be used for legal issues, but on the other hand informant 6 indicates that investigation reports are used by the judiciary.
- The sixth key finding refers to the application of gross negligence in organisations with (multiple) subcontractors; due to different national and corporate applications of just culture, it is almost impossible to obtain a common understanding of just culture.
- The seventh key finding refers to the implementation of just culture on regulatory level; as indicated by informants 7, 8 ,9 and 10, who explain that inspectors do not exactly know what to look for when auditing just culture.

Theme 4: EU-integration

Informants 3 & 4 explain that every country has its own sovereign legal system. The short answer to the research question is "NO". However, although there is no common understanding of what gross negligence is in the EU, The Regulation is the best achievable result, given the political- and legal constraints.

Informants 3 & 4 underline that gross negligence is defined differently from country to country. Some countries do not apply the term gross negligence in their penal codes. There is no uniform judiciary in Europe, that is a utopia, informants 3 & 4 argue. The role and duties of the prosecutor diver from country to country; in the Netherlands, the prosecutor has the sovereign authority to prosecute or not to prosecute. In Italy, the prosecutor must prosecute if he/she is made aware of an occurrence, informants 3 & 4 explain.

The prosecution can only be stopped after approval of a judge, informants 3 & 4 explain. Informants 3 & 4 also explain that in Article 16, the term gross negligence is avoided. Article 16 describes unacceptable behaviour which must be considered as gross negligence. It must be kept in mind that the starting point of The Regulation is not to prosecute. Prosecution is only applicable in extreme cases. The description of cases which must be prosecuted, as described in Article 16 of The Regulation, must not be considered as a definition of gross negligence. That is to avoid national discussions about gross negligence. One country will apply Article 16 and another country will look at the penal code only (informant 3 & 4).

Informant 13 emphasizes that the definition of gross negligence is not presented, and recognised, as 'a definition'. Different (European) countries have different legal cultures, including different cultures of enforcement and prosecution. Intent and fault are considered differently from country to country, informant 13 highlights. Informant 13 explains that Article 16.10 describes the exclusion grounds for prosecution. It can therefore not be considered as a definition of gross negligence. Article 16.10 provides a description of gross negligence. Gross negligence has been described very specifically; Gross negligence is described as the exception to protection, informant 13 clarifies. Context is very important; you cannot legislate everything. Uniformity is not the purpose of the EU. Harmonisation and clarity are purposes of the EU. In the penal code of some countries, the intention plays a crucial role in the judgement of gross negligence. Then you end up with a discussion about a definition of intent. A fascinating, but very difficult area in the view of informant 13.

Based on the interview transcripts, 2 key findings were identified with regard to the theme 'EU-integration' Both key finding of EU-integration were provided by informants 3, 4 and 13:

- First, as explained by informants 3,4 and 13, the tension field between national sovereignty and EU-integration is the source of the absence of a definition of gross negligence in The Regulation.
- Second, it is impossible to regulate everything down to the smallest detail, informants 3,4 & 13 emphasize.

Theme 5: Public opinion

The function of criminal law must be approached in relation to societal developments (informant 13). Incidents in the aviation industry are media sensitive (informant 1, 11, 12 and 14). Informant 1 underlines that there is a significant difference in media sensitivity and public opinion between health care and aviation; In healthcare, there is 'one by one'. Normally those individual cases do not come into the media. But as soon as aviation is involved, the media influences the public opinion. It can be argued that 'just culture' is much more important for the health care system than for aviation. Informant 1 argues that media is an important external influencer of just culture.

Informant 12 accentuated that it is important to understand the relationship between just culture, (social) media and public opinion. As an example, informant 12 points out that other people than those who report an occurrence might contact the media such as passengers.

Two key finding were identified with regard to the theme 'public opinion':

- The first key finding refers to the dynamics of (criminal) law and indicated by informant 13: Criminal law changes due to societal developments.
- The second key finding refers to the relationship between just culture, social media and public opinion, as highlighted by informants 1, 11, 12 and 14; 'Just culture' is influenced by other sources than occurrence reports only, such as media publications.

Theme 6: Trust

There is a significant increase in occurrence reports after the implementation of The Regulation (informants 1, 3 & 4, 7 ,8 ,9 ,10, 11, 12, 14 and 15).

Informants 3 & 4 underline that, despite the increase of the willingness to report, gross negligence on corporate level, in the European context, is a point of concern. In the view of informants 3 & 4, just culture on corporate level can only function properly when there are arrangements between organisations, unions and the authorities.

Informants 11 & 13 accentuate that corporate just culture can be misused; the term gross negligence can be very attractive to shift responsibility/accountability to frontline operators.

One key finding was identified with regard to the theme 'trust':

- From a quantitative perspective, it can be argued that the introduction of The Regulation has resulted in an increased trust in the occurrence reporting system, as indicated by informants 1, 3, 4, 7, 8, 9, 10, 11, 12, 14 and 15.

Theme 7: Just Culture

Just culture was, directly and indirectly, a (main) topic during most of the interviews. Examples of contributions are:

- The understanding of what 'just' is, divers from country to country (informant 1).

- Somebody has to 'draw the line' (informant 1 and 11).
- Instead of letting the judiciary 'draw the line', it can be done on corporate level (informant 11)
- Just culture is introduced both on state level and on corporate level (informant 1, 3&4, 5, 11, 12 and 13)
- The starting point of The Regulation is not to punish (Informant 3, 4 and 13)
- The role of a 'just culture committee' (informant 1, 3, 4 and 12)
- Input of The protection rules in Article 16 of The Regulation (informant 3, 4, 11 and 12)

Informant 11 underlined that 'risk', as applied in Article 16, is viewed from a national risk perception; is there such a thing as 'a danger' or 'obvious risk'? Is there an 'objective danger' which the penal code uses? If that is the case, the 'objective danger' is applied in relation to the national penal code. The same applies to legal judgements about 'objective negligence'. After a judgement about 'objective negligence', a judgement is made about 'subjective negligence'.

An expert then can be prosecuted because he/she did not, by all available means, do everything to prevent an occurrence, informant 11 explains. Informant 11 clarifies the point with an example: In some countries a substitution test is applied to simulate the situation of an occurrence. 3 or 4 people who do the substitution test crash. But 1 person is able to land safely. Then the conclusion can be Look, it was possible to make a safe landing. Negligence has been proven, both obviously and subjectively, informant 11 explains.

Informant 12 argues that it is unknown how to apply the protection rules as described in Article 16, you need to know the criteria, elsewhere you depend on perceptions, interpretations etc. "What for example is 'the manifest' as referred to in Article 16?", informant 12 wonders.

3 key finding were identified with regard to the theme 'just culture':

- First, there exists a tension field (competing discourse) between how just culture is applied on the national level versus the application of just culture on the corporate level.
- Second, 'Just' is understood differently from country to country.
- Third, judging of behaviour, has partly been deregulated from the judiciary to private organisations.

In this section, I briefly share a selection of other issues which were raised by the informants during the interviews: Informants 1, 3, 4, 11, 12 & 14 expressed their concerns in relation to data protection and what to do with available data in relation to 'just culture'. Informants 1, 3, 4, 6 11 and 13 shared their view that just culture principles also should apply to other people than frontline operators, such as managers. Informants 1 & 6 underlined that it is important to realise that decisions made by experts made sense to them, in the context of the operation. Informants 1 & 6 also argued that it can be questioned whether people who judge, really understand the situation he/she is judging. Informants 1, 6, 11 and 14 accentuate the need

for objective criteria to determine what 'commensurate to experience and training', as used in The Definition, means when judging behaviour. Informants 1, 3, 4 & 6 highlighted that different countries apply different legal concepts to determine negligence, such as Garantstellung and duty of care. Garanstellung is applied differently from country to country, informant 6 emphasises. There was no consensus between the informants whether an occurrence can be subject to 'just culture' of 2 or more countries, for example due to delegated airspace.

The information provided by the informants suggest that:

- The Regulation is a political document; One of the consequences is that a suggested definition of gross negligence disappeared from the draft during the law-making process.
- The application of gross negligence varies from country to country; some countries do not apply gross negligence in case of aviation occurrences. On corporate level, the organisation decides which behaviour which is considered as acceptable or not. The consequence is that the 'red line', also referred to as 'the clear line', which is the boundary between acceptable and unacceptable behaviour, only exists after a verdict of a judge or a CEO.
- The aviation sector rapidly comes into the focus of media, which puts pressure on the effectiveness of 'just culture', both on corporate level as well as in relation to the judiciary.
- After the implementation of The Regulation, the number of reported occurrences increased significantly.

Summary of key findings

The key findings of the interview data provide valuable insights into how gross negligence is experienced by the informants. The aim of this section is to provide an analysis of a selection of the key findings in relation to the research question.

I start with analysis of the key findings in relation to gross negligence as applied in criminal law. Informant 3,4 and 13 thoroughly explained why The Regulation does not provide a definition of gross negligence; it was a political compromise, a trade-off, in the legislative procedure of the EU. The information provided by these 3 informants is consistent with the analysis provided by Pellegrino (Pellegrino, 2019). The key finding also offers leads to argue that it is impossible to have one, common, European understanding of gross negligence because The Regulation is enforced through national criminal law, each with its own approach of gross negligence.

Informants 1, 3, 4, 11, 13 raised the issue of a competing discourse between gross negligence on corporate level versus gross negligence on national level; On corporate level, the application of gross

negligence can be problematic, because, as informant 11 explains, gross negligence can be used by the management to find a scapegoat for an occurrence.

Informant 1 addresses the issue about systems view, applied by the ANSP informant works for, versus causality as applied by the judiciary. The different use of concepts create different views on the truth; Sometimes, informant 1 does not want that an ATCO follows the prescribed procedures, but informant 1 explains that that view is not easy to discuss with the judiciary. Informant 6 supports the view of informant 1 that it is essential that a judge must have a practical understanding of a case.

Informant 6 also refers to the competing discourse between national bureaucratic organisations, such as investigation boards and the judiciary. A competing discourse which was confirmed with the accident with LN- OJF.

Informants 3, 4 and 13 highlight the inevitability to make compromises when new legislation is introduced; you cannot get everything you want. From that point of view, there is no reason to be dissatisfied with The Regulation.

The issue of legal certainty was addressed by informant 6 as informant 6 argues that it is very important to exactly know what is meant with gross negligence. Informant 15 confirms that view and argues that it is not sure whether a court will apply the national concept of gross negligence as the lowest threshold for prosecution due to occurrences which have been reported, as required, by The Regulation.

In conclusion: Based on the interview data, there is reason to accept the view that there is no common, European, understanding of gross negligence. Before drawing a conclusion, the interview data will be discussed from a broader perspective in the discussion of this research.

Document analysis

The purpose of the document analysis is to provide a higher order analysis of a selection of documents. The selected documents contain information which is considered as crucial for answering the research question. The analysis focuses on the application of the term gross negligence.

The following documents are further analysed. For a complete description of the documents, please refer to the reference list:

- The Proposal (proposal of the EC, published in 2012, to introduce The Regulation)
- The Draft (EPs response to the draft of the EC. The draft was published in 2013)
- The Journal (Official Journal of the European Union C 198, Volume 56, 10 July 2013, including The Committees view on gross negligence in the context of The Regulation.
- The Regulation
- Guidance material on The Regulation (published by the EC in 2015)
- The Guide (Joint Practical Guide published by the EU in 2016)
- The Document (Technical document – COR paper on Just Culture and liability published by ERA in 2019)

- The Evaluation (evaluation of The Regulation. The Evaluation was published by the EC in 2021)

The Proposal

In The Proposal, the EC underlines the importance of a common understanding of the term gross negligence: "It is important to clearly set the line which protects the reporter from prejudice or prosecution by providing a common understanding of the term 'gross negligence'" (EC, 2012; p.15). The EC suggests a definition of gross negligence: "'gross negligence' means a manifest and wilful violation of the duty of care directly causing foreseeable damage to a person or to a property, or which seriously lowers the level of aviation safety" (EC, 2012; p. 17).

The Draft

In The Draft, the EP suggests amending the text proposed by the EC which explains the importance of a common understanding of the term gross negligence: "It is important to clearly set the line which protects the person involved in the reported occurrence from prejudice or prosecution by providing a common understanding of the term 'gross negligence'" (EP, 2013; p. 13). In The Draft, the EP suggests amending the definition of gross negligence as suggested by the EC: "'gross negligence' means a manifest and wilful violation of the duty of professional responsibility directly causing foreseeable damage to a person or to a property, or which seriously lowers the level of aviation safety" (EP, 2013; p.12).

The EP accentuates the importance of 'trust' by referring to a genuine climate of trust in relation to just culture and by emphasizing the importance of trust of employees, staff-members and the trust of reporters in just culture. In The Draft, no reference is made to a sociotechnical system

The Journal

In The Journal, The Committee shares its view on the proposed implementation of The Regulation. The Committee emphasises the importance to specify what is meant by gross negligence, by referring to the proposed definition of gross negligence: "The rule under which employees shall not be subject to prejudice from their employer, except in cases of gross negligence (as defined in Article 2(4) of the proposal), on the basis of the information reported, is reinforced" (EU, 2013; p. C 198/75).

The Regulation

In The Regulation, the term gross negligence is applied once: In The Definition. Contrary to The Proposal and The Draft, gross negligence is not defined in The Regulation. Behaviour which is considered as unacceptable in the context of just culture, is described in recital 37 and in Article 16.10(b). No reference is made to 'systems thinking' in The Regulation.

Guidance material

The term gross negligence is mentioned twice in the guidance material. In both cases, gross negligence is referred to the definition of just culture in Article 2 of The Regulation. In the guidance material, the aim

of just culture is described as: "It aims, in particular, at ensuring confidence of aviation professionals in occurrence reporting systems and encourages them to reports any relevant safety information with a view to contribute to the enhancement of aviation safety and accidents prevention" (EC, 2016; p. 25). No reference to systems thinking is made in the guidance material.

The Guide

The Guide is a platform of general drafting principles for EU-institutions, ensuring that legal acts in the EU are drafted clearly and precisely so that they can be understood better correctly and implemented correctly. The drafting of legal acts in the EU must be clear (easy to understand and unambiguous), simple and concise (avoiding unnecessary elements) and precise (leaving no uncertainty in the mind of the reader), taking into account the multicultural and multilingual character of the EU and the complexity of the EU-system. Other principles which must be followed in the drafting process of legal acts are the equality of citizens before the law and legal certainty. Legal certainty refers to the possibility to foresee how the legal act will be applied. There is a tension field between the drafting principles and the practical implementation of legal acts in the EU (EU, 2015; p. 10):

> It is acknowledged that the requirement that a text be both simple and precise may create a conflict. Simplification is often achieved at the expense of precision and vice versa. In practice, a balance must be struck so that the provision is as precise as possible, whilst remaining sufficiently easy to understand.

Regarding regulations, The Guide emphasises the element of legal certainty: "Since regulations are directly applicable and are binding in their entirely, their provisions should be drafted in such a way that the addressees have no doubts as to the rights and obligations resulting from them" (EU, 2015; p. 11). In order to avoid the risk of ambiguities, drafting principle 14 states that: "where the terms used in the act are not unambiguous, they should be defined together in a single article at the beginning of the act. the definitions shall not contain autonomous normative provision" (EU, 2015; p. 41).

As the term gross negligence has not been defined in The Regulation, it can be concluded that the EU considers the term gross negligence, as applied in The Regulation, as unambiguous.

The Document

ERA advocates for a systems approach of just culture because just culture builds on mutual trust between all stakeholders in a sociotechnical system such as employees, operational actors and authorities. Trust is a prerequisite for a proper functioning just culture; ERA suggests that increased trust will not only be beneficial for the implementation of just culture, but that increased trust also, as a side-effect, has a positive effect on financial performance.

The Evaluation

"The main objective of this evaluation is to determine whether the Regulation has had the expected effect on safety and whether it has contributed to the reduction of accidents and related fatalities in aviation throughout the EU" (EC, 2021; p. 4). The EC applied five criteria to determine whether the original objectives of The Regulation had been met: Effectiveness, efficiency, relevance, coherence, and EU added value. The EC identifies that a limited number of objectives related to just culture have been achieved, such as the establishment of advance administrative arrangements with judicial authorities. No evidence was found that 'harmonised protection', as referred to in Article 1 (b) of The Regulation, and/or the applicability of the protection rules as specified in Article 16.10 has been evaluated.

Summary of document analysis

Although the EC, EP and The Committee stressed the importance of providing a definition of gross negligence in The Regulation during the law-making process, the definitions of gross negligence suggested by the EC and the EP were removed from The Regulation. The absence of a definition of gross negligence is a result of national political interests of one or more Member States of the EU. No evidence was found that the consequences of the lack of a definition of gross negligence have been taking into account in The Evaluation.

Compared to The Regulation, including The Guidance Material, and The Evaluation, two main findings were made in the analysis of The Document. First, The Document refers to just culture in the European railways system in the context of a sociotechnical system. That finding suggests that just culture in the European railway system is approached from a broader perspective than just culture in the European aviation system. Second, The Document more explicitly highlights the importance of mutual trust as a prerequisite for a proper functioning just culture.

Findings summary

The information provided by the informants, was confirmed to a large extent by the document analysis. The impression that emerges is that 'a harmonised protection', as referred to in Article 1(b), does not exist due to the lack of a common, European, interpretation of gross negligence.

Gross negligence as applied in The Definition, must not be confused with the term gross negligence as applied in several national penal codes of countries which have implemented The Regulation. Gross negligence is 'defined' in Article 16.10(b) of The Regulation. The 'definition' in Article 16.10(b) may, however, not formally be considered as 'a definition'; The definitions which are applicable in The Regulation are provided in Article 2, 'Definitions'. This finding includes a competing discourse.

Other salient findings of this study include:

- The existence of competing discourses which affect how people experience gross negligence in the context of The Regulation.

- The complexity of the legal system in the EU
- The complicatedness concerning judging blameworthiness in relation to human error in the relationship between 'safety', 'risk perception' and (criminal) accountability
- The absence in The Regulation of a 'systems view' in relation to 'just culture' and 'gross negligence'.

For a detailed overview of identified competing discourses, please refer to Appendix E The competing discourses which are shared in the following summary, are considered as the most relevant competing discourses and they are discussed in the chapter 'discussion'. Summary of identified competing discourses:

- Gross negligence as applied in The Regulation versus gross negligence as applied in penal codes, gross negligence ≠ gross negligence.
- EU integration versus national sovereignty
- Just culture on corporate level versus just culture on national level.
- The overwhelming perspective that emerged is that gross negligence, as used in the rule, is ambiguous and serves to hinder the aims of just culture as seem through the views of safety science and the ambitions of the rule.

Discussion

Introduction

The aim of the discussion is to review the research findings in the context of the research question. This chapter is also intended to share final reflections and to offer suggestions for further research.

The rationale of this research was to evaluate whether it is possible to achieve one common understanding of 'just culture' in Europe, by approaching the term gross negligence from a system safety perspective. The introduction of The Regulation is a good opportunity to explore whether it is possible to introduce just culture in the multinational context of the EU. Views on 'just' are, amongst other, determined by (national) culture. The scope of the research is limited to gross negligence in the context of The Regulation. Nevertheless, lessons can be learned from this research when applying just culture principles in other industries than aviation.

In the context of The Regulation, the term gross negligence is applied to define the boundary between acceptable and unacceptable behaviour; When is, in the context of The Regulation, human error considered as blameworthy?

In essence, the main purpose of this research was to figure out whether The Regulation offers clues that justify the conclusion that there is one common understanding of criminalization of human error in the European aviation system. Norms in societies are constantly subject to change, and so are societies perceptions of accountability, risk, justice and blameworthiness. The evolution of norms trigger initiatives to modernise legislation. The entry of just culture in the legal system of the EU is a direct result of the changes of norms. Social change resulting in new legislative initiatives, such as The Regulation, illustrates the importance not only to evaluate and explore The Regulation from a legal or safety science point of view but also from the view of sociology of law and other scientific disciplines.

Gross negligence

Ambiguities, vagueness and indeterminacy must be considered, and understood, as inevitable trade-offs in the context of the complexity of the legal system of the EU, and therefore have great influence on The Regulation and the application of just culture, including gross negligence. It may be concluded that gross negligence is significantly influenced by ambiguities, vagueness, multilingualism and indeterminacies.

Gross negligence can be seen as an indeterminacy because it has not been specified whether gross negligence refers to a European concept of negligence, gross negligence in the context of national criminal law of the Member States or gross negligence in the context of a corporate safety culture. Furthermore, it could be argued that gross negligence is a vagueness because the definition of gross negligence has not been included in Article 2 (definitions), but has been moved to Article 16.10(b), without specifying that Article 16.10(b) in fact provides the definition of gross negligence as explained by informant 3, 4 and 13 and highlighted by Pellegrino (Pellegrino, 2019).

Just culture and gross negligence are both ambiguous because The Regulation refers to two concepts of just culture, a corporate concept of just culture and a national concept of just culture, applying exactly the same definition for both concepts – therefore a dualism of just culture has emerged.

It can be said that just culture, including gross negligence, in the context of national just culture is a vagueness because just culture has been defined as a culture, while it in fact is a legal concept. It can also be said that there seems to be an asymmetry between just culture and gross negligence in The Regulation which increases ambiguities, vagueness and indeterminacy furthermore:

Just culture has two dimensions: A corporate dimension and a dimension in the context of the penal code (the legal dimension). Gross negligence has three dimensions: Gross negligence as intended in The Regulation and described in Article16.10(b), gross negligence as applied in the criminal laws of those Member States which apply gross negligence in their national criminal laws and the application of gross negligence on corporate level.

Gross negligence and the research question

The research question for this study is: Is there a common European understanding of gross negligence as cited in the definition of just culture in Regulation (EU) 376/2014?

The EC, EESC and EP underlined the importance of a common, European, understanding of the term gross negligence before The Regulation was implemented in 2014; They emphasized the importance to clearly set the line for protection from prejudice and prosecution (EC, 2012; EESC, 2013; EP, 2013). Despite their view, the definition list in Article 2 of The Regulation does not include a definition of gross negligence. Neither is there a description of 'the clear line' or 'boundary between acceptable and blameworthy or culpable behaviour' in the guidance material of The Regulation. The Evaluation does not include feedback to the ambition of the EC, EP and That begs the question: How clear is the line that the EC, EESC and EP referred to during the drawing process of The Regulation?

The original design of this research was based on the assumption that gross negligence, as applied in The Definition, refers to the application of gross negligence in the national penal codes of the countries to which The Regulation applies. From the perspective of the different national European penal codes, gross negligence could be interpreted as the lowest level of culpability which is required for prosecution in the context of an aviation occurrence which has been reported to the authorities as specified in The Regulation. A common, European, understanding and application of gross negligence in the different penal codes was considered as a prerequisite to ensure a successful implementation of the Harmonised Protection. This research reveals that that assumption turns out to be too premature.

Gross negligence and The Regulation

The literature review, interviews and document analysis provided valuable insights into the complexity of the legal order of the EU and the relevance of that complexity for this study. The information provided by the three sources, complement each other very well. An example is Robertson's point that EU

legal texts are primarily written for (legal) experts, which is part of EU culture. Robertson's view matches the view shared by informant 11, that it is unclear what is meant with gross negligence, if the meaning of gross negligence is described in Article 16.10(b). Informant 11 quite rightly points out the need for clarity: Whose risk perception is referred to in Article 16.10 (b)? The lack of real definitions and taxonomy is cleverly done to reach a political compromise.

The formulation of Article 16.10(b) might be clear enough for legal experts who know exactly how the formulation emerged through a legal - and political process, but informant 11, with good reason, powerfully expressed that Article 16.10(b) is unclear for the members of the aviation community because it has been formulated vaguely and ambiguously. It can be stated that this is an example which illustrates that it is by no means a certainty that aviation professionals, who are the people who are affected by The Regulation, have a reasonable opportunity to understand what is really meant with the formulation as applied in Article 16.10(b). The example links multiple themes which emerged during the interviews to the research question: Judiciary, bureaucracy, EU-integration, trust and just culture.

The findings presented in this research, contribute to new understandings and insights in relation to 'gross negligence' as applied in The Regulation. The new understandings and insights relate to:

- The underlying causes which make it impossible to fulfil the ambition of the EC, EESC and EP to achieve a common, European, understanding of gross negligence, as referred to during the drafting process of The Regulation.
- The relationship of language, culture and law versus EU-integration and the consequences for 'just culture' as referred to in The Regulation.
- The absence of an unambiguous understanding of human error, both in safety science and in The Regulation.
- The absence of a systems approach in The Regulation, including the relationship between complexity, emergence, justice, and accountability in the recitals of The Regulation and in The Regulation.
- The relationship between factors which affect risk perception, such as national culture, and justice in the context of The Regulation.
- The role of national political interests as a constraint for the development of EU-acts which are consistent with the general principles as published in the JPG.
- The presence of competing discourses related to The Regulation.

Based on the findings of this research, it is claimed that both safety and law must be viewed as emergent phenomenona - neither safety nor law can be deconstructed into individual components. Safety is an emergent phenomenon of a sociotechnical system (the aviation system). Law is an emergent phenomenon which emerges as a result of the combination of amongst others, history, societal developments, (legal) culture, linguistic factors and political compromises.

It is therefore claimed that the research question cannot be answered by applying reductionism to interpret the findings. The findings must be interpreted following the line of thinking of legal experts as Tamanaha: Law (in this research EU-law, The Regulation, just culture and gross negligence), must be studied naturalistically, historically and holistically because it is an emergent phenomenon (Tamanaha, 2018).

It can be said that the meaning of the term gross negligence, in The Definition, includes ambiguities, vagueness's and indeterminacies which cause legal uncertainties, including legal predictability, for people who are affected by The Regulation.

Firstly, gross negligence has not been defined in The Regulation. Nor does The Regulation offer a legal framework and - taxonomy and/or legal concept which unambiguously describes what is meant with gross negligence in the context of *actus reus* and *mens rea*. An example is the relationship between the adjective 'gross' and the substantive 'negligence'. What is 'gross negligence' if we do not exactly know what is meant by 'negligence'? Additionally, it is not specified in which legal concept 'negligence' has been anchored. As informant 13 pointed out: Gross negligence in The Regulation must not be confused with concepts such as duty of care or Garantstelling.

Secondly gross negligence refers to just culture at both the corporate and the national level. In the latter case, gross negligence is enforced through criminal law. The corporate just culture is enforced by the management, in the context of just culture as an element of a broader safety culture, as referred to in recital 36 of The Regulation. In The Regulation, it is not specified how management is expected to deal with gross negligence in the context of a corporate just culture; is it mandatory that management notifies the judicial authorities if unacceptable behaviour, in the context of the corporate safety culture, is suspected? Can organisations apply a more restrictive view of acceptable behaviour than the judicial authorities? Etc. etc. These are highly relevant questions which must be answered to achieve the ambition of 'a uniform protection' as referred to in Article 1(b) of The Regulation.

Thirdly, gross negligence is applied differently in different national criminal laws. Several informants, such as informant 5, 15 and 16, who all hold a master's degree in legal science and who were all involved in the implementation of The Regulation on Member State level, referred to gross negligence as applied in the national criminal law. Informants 8 and 9, who work for different regulatory authorities than informants 5,15 and 16, also indicated that they refer to the national penal code for the interpretation of gross negligence. Informant 10, who works for a regulatory authority of a country which does not apply gross negligence in the criminal law, indicated that gross negligence could not be related to the national criminal law. It is argued that The Regulation does not offer clear leads how Member States are expected to understand, and how to apply, the term gross negligence in relation to their national penal code.

Fourthly, because the criminal law of some Member States, such as Switzerland and Latvia, does not make provision for gross negligence in the context of aviation occurrences, I argue that it is impossible that gross negligence, as used in The Definition, refers to the national application of gross negligence as specified in the criminal law of the Member State. Therefore, gross negligence must not be confused with how gross negligence is enforced through the national penal codes. The consequence is that people can be prosecuted

for negligence as used in the national criminal law, for human error which is considered as gross negligence in the context of The Regulation. Informant 11 expressed the concern that people will be prosecuted for negligence in the absence of gross negligence in criminal law. This research shows that this concern is well justified. It is considered that the ambiguities, vagueness's and indeterminacy of gross negligence include three dimensions: Gross negligence in the context of the corporate just culture, gross negligence in the context of national criminal law and gross negligence in the context of The Regulation. It can be said that gross negligence fits perfectly with 'The Myth of EU Terminology Harmonization on National and EU Level' as highlighted by Bratanić & Lončar (Bratanić & Lončar, 2015).

The development of The Regulation is a case in point of the two points in the life of legal texts as highlighted by Robertson (2015): The legal text is created coded and encoded in linear text in moment 1 by experts. In moment 2, the legal text is decoded and interpreted by people who lack the knowledge of why the legal text has been formulated as it is; those people interpret the legal text in a way that makes sense to them, creating a mental picture based on their understanding of law and language (Robertson, 2015). It can be said that the phenomenon of local rationality does not only apply during the exercise of duties of frontline operators, but that local rationality also is highly relevant in the interpretation of legal texts. Acknowledging the importance of local rationality in relation to the interpretation of legal texts, lends weight to the argument that law must be considered as an emergent phenomenon.

It is beyond the scope of this research to analyse all the details of factors which influence (EU) law, such as The Regulation. Because law is considered as an emergent phenomenon, I argued that it is impossible to identify all the factors how gross negligence exactly must be viewed in the context of The Regulation.

The consequence of the given that gross negligence is viewed as an emergent phenomenon implies that it is impossible to use gross negligence as 'a clear line' (or boundary) between acceptable and unacceptable behaviour.

In my view, 'the clear line' to which the EC, EESC and the EP referred during the drafting process of The Regulation, only exists as a judgement after an occurrence. That judgement depends on assumptions, interpretations and perceptions which are all influenced by biases and heuristics. It, therefore, is important that no false expectations are raised by claiming that 'a clear line' exists in the context of just culture.

The recognition that gross negligence is an emergent phenomenon also lays the foundation for a better balancing between the social values safety and justice; Recognition of emergence, implies the recognition the need to understand system relations and -properties and the role of system boundaries and interactions; In the case of gross negligence, it can be questioned how good we really understand the system of relationships between the aviation system and the (European) legal system. An example is the system boundary between the aviation system, which in principle is not limited by national borders, versus the system boundaries of (national) criminal law, including nationally applied legal concepts such as negligence.

The EU seeks to guarantee free movement of goods, capital, services and people (EU, 2012). In that respect, aviation is a sociotechnical system which can facilitate at least two of the freedoms of the EU: Free movement of goods and people through the single market. My point is: Trade-offs between interests of the four identified systems (the European legal system, single market of the EU, the aviation system and national rooted criminal law) are unavoidable.

This research does not aim to answer questions about system boundaries, but the findings of this research illustrate the added value for more in-depth research to better understand how the systems interact in order to develop improvements. A better identification of relevant systems and the interplay between the systems can provide valuable insights for future discussions and legislative developments about just culture.

As Robertson points out: The starting point of EU-law is the operation of markets, competition and international relations (Robertson, 2015) This is important information to take into account when trying to understand gross negligence; although the national judiciary enforces gross negligence through national criminal law, (national) criminal law is not the starting point of gross negligence as used in The Regulation.

As noted previously, in The Regulation, gross negligence is mentioned but once: In the Definition. During this research, it became clear that The Regulation, including gross negligence, must be viewed in the context of the multilingual and multicultural character of EU law. Although you would expect that The Guidance Material of The Regulation is the ideal place to specify what is meant with gross negligence, no further context of gross negligence is provided in the guidance material (EC, 2015-b).

The literature reviewed and the interviews which were performed show that no European taxonomy, which specifies gross negligence in the context of a European legal concept, exists. As a consequence, it can be stated that it is unclear what exactly the grounds for exemption from criminal liability are in the context of The Regulation.

The view of the EC, EESC and EP to specify gross negligence is consistent with the EPs proposal for the development of a European criminal justice area (EP, 2009). On the one hand, it can be said that The Regulation has been implemented too early because a European criminal justice area has not yet been developed. On the other hand, it can be argued that the implementation of the term gross negligence in The Regulation fits in with the development of a European criminal justice area.

The Definition, in which the term gross negligence is used, defines just culture as a 'culture'. To a certain extent it is defensible to claim that a corporate application of gross negligence, in the context of a corporate just culture policy, is part of a broader (corporate) safety culture as pointed out in recital 36 of The Regulation. This research shows that the suggestion that just culture can be defined as a culture on a state level is untenable. At state level, just culture is a legal concept which is enforced by judicial authorities through the penal code.

From a legal, and linguistic perspective, it is a legitimate question to ask why the adjective 'gross' in relation to the noun 'negligence' is used in The Definition. Whilst no European legal concept of criminal law exists in which 'negligence' has a place: 'Gross negligence' is 'gross' in relation to what?

The use of gross negligence in The Definition is a prime example which illustrates Robertson's point that legal terms are abstract, and system bound.

Gross negligence is abstract because The Regulation does not provide a legal concept in which gross negligence is referred to in the context of mens rea and culpa. There is no reference point of 'gross negligence' in EU-law. It is unclear how gross negligence relates to a lower- and higher level of culpability.

Gross negligence is system bound, because extensive knowledge and experience is required to understand the 'inside perspective' of the term 'gross negligence' in the context of the EU-law-making system. The 'inside perspective' refers to the people who work for the institutions of the EU and people who have extensive knowledge and experience of the rulemaking process of the EU. Three of the informants (informant 3, 4 and 13) gave the impression that they were very knowledgeable about the capabilities and limitations of a successful implementation of The Regulation, including the application of The Definition. Informant 13 explained that a definition of gross negligence was unacceptable for one or more countries to support the introduction of The Regulation. Therefore, a solution had to be found which was politically acceptable; the definition of gross negligence was removed from chapter two (definitions) of The Regulations and moved to Article 16.10(b).

The definition of gross negligence is in my view not recognizable as a definition in The Regulation because it is 'hidden' in another article than Article 2 (definitions). As a consequence, it is unreasonable to expect that people to whom The Regulation applies, are able to recognize 'the clear line' because 'the clear line' does not exist. If we put these parts of information together, the following development emerges:

- The EC suggests a definition of gross negligence.
- The EP suggests amending the definition suggested by the EC.
- In The Regulation, a combination of the definition of gross negligence as suggested by the EC and the EP respectively, including some minor adjustments, emerges as a situation in which the protection rules are not applicable.

The description, of what is meant with gross negligence is (EU, 2014; p. L 122/36):

> a manifest, severe and serious disregard of an obvious risk and profound failure of professional responsibility to take such care as is evidently required in the circumstances, causing foreseeable damage to a person or property, or which seriously compromises the level of aviation safety.

Appendix F includes a screenshot from page 17/55 of The Draft. It was the intention of the EP that the national courts in the EU were expected to apply a common interpretation of gross negligence after the implementation of The Regulation. An eye-catching detail is that both the EC and the EP referred to the

obligation/legal concept 'duty of care'. The term 'duty of care' is not included in The Regulation. Another striking detail is the introduction of the term 'obvious risk' in Article 16.10(b). The judgement of fault becomes dependent on risk perception. It could be said that a uniform protection only can be achieved when national courts in Europe apply a common perception of risk. As discussed in the literature review, risk perception depends, amongst other facets, on national culture. It can therefore be stated that it is impossible to achieve a common interpretation of gross negligence.

A large majority of the people who were interviewed for this research refer to the national application of gross negligence which is anchored in the national criminal law. The interviewees include two legal experts with a PhD in legal sciences, one of them is specialised in EU-law and works for one of the EU Institutions. Both indicated that they were not entirely sure how national courts interpret and apply gross negligence in the context of The Regulation. Gross negligence in national criminal law exists in the context of a legal concept such as Garantstellung or Duty of Care, including a legal framework and taxonomy which relates gross negligence to other degrees of culpability. It is, in my view, reasonable to expect that people who work with The Regulation and those who are affected by The Regulation refer to their national criminal law in the absence of such a European legal concept.

It can be said that the use of the term gross negligence in the definition of just culture, in The Regulation, is problematic for several reasons:

Firstly, the definition of just culture, as applied in The Regulation, is a copy of the corporate definition of just culture as used by Eurocontrol (Eurocontrol, 2005). Eurocontrol specifies that, in cases of gross negligence, the corporate limits of just culture have been reached. Gross negligence and 'criminal acts' must be followed up by the judicial authorities (Eurocontrol, 2005).

Secondly, gross negligence is part of the taxonomy, and legal terminology, which is applied in several national penal codes in Europe. In those national taxonomies, gross negligence is related to negligence, including a legal concept which underpins the national legal taxonomy and terminology. Contrary to the absence of a European legal concept of negligence and the absence of a European penal code.

Thirdly, by using gross negligence in the definition of just culture in The Regulation, without any references to legal context, it can be stated that The Regulation does not fulfil EUs general principle of the drafting of legal acts: They must be clear, simple and precise (EU, 2015).

Gross negligence ≠ gross negligence

From the findings of this study, it is considered that gross negligence, as applied in The Definition, is not the same as gross negligence as applied in national criminal laws of countries which have implemented The Regulation, nor is it the same as gross negligence as applied in corporate just culture policies. As informant 13 argues: Gross negligence in The Regulation refers to 'criminal behaviour' and must not be related to concepts such as duty of care or Garantstelling. The view of informant 13 is shared by informant 3&4, and is confirmed by Pellegrino (Pellegrino, 2019). That insight sheds new light on this research and

the research question. What is meant with gross negligence in the context of The Regulation, is specified in Article 16.10(b).

Human error

In the safety discourse, human error is frequently identified as the cause of an occurrence. However, there is no consensus on what human error exactly is. The Definition refers to actions, omissions and decisions which are related to experience and training. In The Regulation, the term human error is not applied at all, nor does The Regulation offer a '(human) error taxonomy'. It must be stated that a clear and unambiguous understanding of human error is an absolute necessity if it is desirable to judge blameworthiness of human error.

The Definition in The Regulation refers to the relationship between experience and training versus human error. Experience and training are two of many cognitive parameters which impact human performance, including the likelihood to err. It can be stated that it is a shortcoming that The Regulation does not refer to cognitive factors which negatively impact human performance during stressful situations. The combination of cognitive factors play a crucial role in a person's ability for problem solving and decision- making. As Vink highlights: experts sometimes make mistakes because they are experts (Vink, 2017).

Competing discourses

During this research, several competing discourses in relation to gross negligence emerged. In this chapter, 2 competing discourses will be discussed: Gross negligence as a competing discourse, including three different dimensions of gross negligence. The other competing discourse which will be discussed is the competing discourse between (national) governmental institutions.

Gross negligence as a competing discourse

The first competing discourse in relation to gross negligence refers to the corporate understanding of gross negligence versus the application of gross negligence in the penal code.

The Regulation does not specify that the acceptability of human error, in the context of corporate just culture, must be in harmony with the acceptability of human error in the context of the national just culture, as applied in the penal code. Simply put: Human error can be acceptable in the light of corporate just culture, but the same human error can be unacceptable in the framework just culture as applied in the penal code. And vice versa. The Regulation, nor the guidance material, describe how organisations and the judiciary are expected to cope with the tension area which arises because of a possible mismatch in the application of gross negligence, as part of the corporate just culture, and gross negligence as part of the national just culture. The above argument was confirmed by multiple informants.

In the experience of informant 1, corporate just culture is primarily event driven and the national just culture, as applied by the judiciary, is primarily outcome driven. Behaviour which is considered as 'just' or 'normal' inside the organisation, can be considered as 'unacceptable' by the judiciary. If human error is considered as negligent by the organisation, it does not mean that the same human error is viewed as negligent by the judiciary and the other way around. On the corporate level, it is possible to define and to describe what is 'acceptable' and what not.

Informants 3 and 4 argue that The Regulation is a sound solution because it is consistent with the intention of the legislator. Use of gross negligence in the definition of just culture is no problem as long as the judiciary decides whether behaviour qualifies for gross negligence or not. On corporate level, it is a concern. In the view of informant 3 and 4, a corporate just culture commission must evaluate cases which come close to the border of 'unacceptable behaviour'.

Informants 7, 8, 9 and 10 are safety experts working for four different national aviation authorities. They all represent aviation authorities of countries which are member states of the EU. None of the four member states have published a definition of gross negligence. They all refer to the application of gross negligence as applied in the national penal code. The informant who represents a country which does not apply the term gross negligence in the penal code was not able to indicate how the national judiciary will apply gross negligence. None of the four experts felt that they were in a position to indicate that inspectors, who audit the implementation of corporate just culture, are properly prepared for their auditing task in connection with corporate just culture.

Informant 11 points out that The Definition is a corporate definition which became part of The Regulation. The Definition might work properly within the judiciary, but for corporate just culture, there is good reason for concern. Informant 11 holds the view that the corporate application of gross negligence is terribly subjective because the job of a manager is different from than that of a safety investigator, a regulator, or the judiciary.

In the light of corporate just culture, gross negligence becomes very attractive as you can find somebody who is going to pay for the error. With The Regulation, somebody at the corporate level has to 'draw the line' instead of the judiciary. One risk is that technical errors are criminalized. Managers, without any technical knowledge, have received a tool to judge technical errors.

The Regulation describes much about the accountability of frontline operators, but nothing about the corporate accountability in relation to occurrence reporting. Informant 11 is worried that 'bad cases' are unavoidable, because Article 16.10(b) says nothing about the management who let people in a specific situation. It can be wondered whose wilful misconduct Article 16.10(b) refers to.

Informant 13 stressed that the corporate just culture is subordinate to the national just culture; stakeholders must watch out for claiming that corporate just culture is something different than just culture at state level.

At the corporate level it must be noted that the threshold 'extreme behaviour' is required before disciplinary actions can be considered. Informant 13 suggests that gross negligence is relevant to criminal law. In the context of corporate just culture informant 13 considers gross negligence as not appropriate. In an early stage of the drafting process of The Regulation, the EC made the mistake to apply the corporate definition of just culture in The Regulation. The result was that a corporate definition of an organisation became a definition in the legal order if the EU. The EC did not realize what the consequences were. A (corporate) definition of 'gross negligence' was put in Article 2 of The Regulation. During the consulting process with the Member States, one or more Member State, indicated that it was unacceptable that the EC defined terms in the national penal code. Visually, the definition of gross negligence disappeared from Article 2, but it came back in Article 16.10. The result of the political compromise is that the definition of 'gross negligence' may not be recognizable as 'a definition' in The Regulation.

The second competing discourse in relation to gross negligence refers to the application of gross negligence in national context.

Informant 1 argues that there is no scope for harmonized protection because the understanding of what gross negligence is, is different in every organisation and on Member State level. The understanding of what 'just' is, varies from country to country. In one country a retributive legal system is regarded as 'just', but another country can have a different view on what is 'just'. In the country in which informant 1 works, negligence is based on Garantstellung. In other countries, negligence is based on duty of care or other legal concepts. Informant 11 shares the concern that gross negligence does not exist in every country where The Regulation is applicable. In the view of informant 11, every country which does not know gross negligence in the penal code, will take The Regulation and take the closest level of blame to gross negligence. Those countries will use the lower, less stringent form of negligence to close the gap to gross negligence. Negligence exists in every penal code, but in different legal approaches such as objective-, subjective-, qualified- and unqualified negligence. Article 16.10(b) is not a real definition of gross negligence; It is a political formulation. Informant 3 and 4 shared the view of informant 11 that there is no common interpretation of gross negligence in Europe. They emphasise the importance of an ongoing, structured, dialogue between the aviation industry, representatives of employees and the judiciary. It is not the task of professionals to determine whether human error must be classified as gross negligence or not. As long as the behaviour is integer and meets the professional standards, the behaviour is considered as 'acceptable behaviour'.

The third competing discourse in relation to gross negligence refers to the selection of parameters which determine the applicability of culpability.

In the definition of just culture, 'experience' and 'training' are applied as parameters to judge whether a person can be punished for his/her 'errors'. This study learns that The Regulation, by limiting human error in relation to 'training' and 'experience', does not take into account other relevant parameters which play a crucial role in the emergence of human error; Stress, for example, impacts cognitive processes due to psychobiological relationships. As cognitive processes are impacted, a person under stress might not be able

to take rational decisions due to factors such as work overload which possibly escalates to the startle effect, regardless of the amount of 'training' and 'experience'. Judging a person after an event and limiting the relevant parameters to 'experience and training', does not do justice to the psychobiological effects of a stressful situation. It is therefore highly questionable whether 'experience and training' are 'just' factors to determine culpability.

Competing discourse between (national) governmental institutions

The investigation report published by AIBN in 2018, following the accident with LN-OJF in 2016, was not only used for the purpose of improving 'flight safety' but also for the purpose of a juridical investigation. The fact that the police/prosecutor uses the AIBN-report for other purposes than explicitly intended, and clearly indicated by AIBN on page one of the accident report, proves the existence of a bureaucratic dualism; it is the competing discourse between two governmental institutions which both fall under their respective ministries (Ministry of Transport versus Ministry of Justice and Public Security), both serving different public interests (flight safety versus administration of justice) and both working from their own perceptions of the accident.

In this specific case, the prosecutor decided not to prosecute. Next time, the prosecutor might decide to prosecute based on the findings of a report published by AIBN. From a just culture perspective it can be questioned whether trust in the safety investigation is served by the existence of this bureaucratic, competing discourse.

One could assume that it can be reasonably expected that the existence of such a competing discourse severely undermines trust in just culture. The use of the accident report for juridical purposes by the prosecutor, however, does not come as a surprise; informant 6 addressed the issue that the judiciary uses investigation reports for prosecution purposes. What is surprising in this case, is the openness of the prosecutor in the interview with the media and in the press release in which the use of the AIBN-report for juridic purposes is disclosed. The openness gives the impression that the use of the accident report by the prosecutor is not a result of malicious intent. That being said, there is no reason to put the sincere intentions and integrity of the prosecutor in question. In that context, it is important to emphasise that the phenomenon local rationality is not limited to the people directly involved in an event; we are all subject to local rationality.

The example of the accident with LN-OJF is not unique as a competing discourse between investigation boards and the judiciary. On 30. September 2015, the landing gear of a commuter aircraft was retracted during the rotation at the airport of Saarbrücken (Germany), resulting in a rejected take-off with the landing gear in the 'up' position (BFU, 2016; FSF, n.d.-c;). No persons were injured, but the aircraft sustained severe damage. (BFU, 2016; FSF, n.d.-c). In the report, BFU states: "The sole objective of the investigation is to prevent future accidents and incidents. The investigation does not seek to ascertain blame or apportion legal liability for any claims that may arise" (BFU, 2016; p. 26). A spokesperson for the prosecuting office stated, after that the final report of the BFU was released, that the prosecutor had initiated

an investigation against the co-pilot of the aircraft for negligently endangering air traffic and that the prosecutor's office had been waiting for BFU's report (Kruse, 2016). The case against the co-pilot was dismissed in 2017 after the prosecutor had concluded that the early retraction of the landing gear by the co-pilot could not be considered as a criminal offence (Heine, 2017). The fact that the German prosecutor initiated a criminal investigation because of the suspicion of negligence and not of the suspicion of gross negligence, indicates that the judiciary in Germany does not apply gross negligence as the lowest standard of fault for (criminal) prosecution in the context of The Regulation.

Other examples which confirm the existence of the competing discourse between investigation boards and the judiciary, the investigations into the accidents with Concorde F-BTSC in France in 2000 (BEA, 2002; Michaelides-Mateou & Mateou, 2016), ATR 72 TS-LBB in Italy in 2005 (ANSV, 2008), Boeing 737-800 in The Netherlands in 2009 (FSF, 2009; Slager, 2009; Kortleven, 2013; Michaelides-Mateou & Mateou, 2016) and the accident with Hawker Hunter T7 G-BXFI in England in 2015 (AAIB, 2016; BBC, 2022). The examples of the accidents discussed above, confirms the importance of a continuous dialogue between government agencies and the aviation industry about the implementation of just culture on both a national- as well as on an international level. At the national level, the dialogue is necessary in relation to mutual transfer of knowledge and experience for the purpose of mitigating the consequences of the identified competing discourse between national government services. On an international level, the dialogue is important to achieve the highest possible degree of uniform protection in the Member States, as national experiences can be shared.

Final reflections and suggestions for further research

It is legitimate to raise the question whether EU-society really has got what it wanted and expected when The Regulation was implemented.

The findings of this research suggest that there are sufficient grounds to advocate the view that a common, European, understanding of gross negligence does not exist. The lack of a uniform interpretation of gross negligence, creates a gap between how gross negligence is presented in The Regulation and how gross negligence is experienced by those who are affected by The Regulation. It, therefore, appears justified to claim that 'the clear line' that the EC, EESC and EP referred to before the implementation of The Regulation does not exist neither.

I am of the belief that it is remarkable that the proper functioning of gross negligence, as 'the clear line' between acceptable and blameworthy behaviour, has not been discussed comprehensively in The Evaluation.

In the definition of just culture, experience and training are applied as parameters to judge blameworthiness. This study has established that The Regulation, by limiting human error in relation to training and experience, does not take into account other relevant parameters which play a crucial role in the emergence of human error. It is therefore highly questionable whether experience and training are just factors to determine culpability (or gross negligence) in the context of just culture.

It can be stated also, that, contrary to the general principles for the drafting of legal acts in the EU that legal acts must be clear (easy to understand and unambiguous), simple and concise (avoiding unnecessary elements) and precise (leaving no uncertainty in the mind of the reader), the term gross negligence, as applied in The Regulation, does not fulfil any of these three criteria.

Gross negligence, as applied in The Regulation, cannot:

- …Be easy to understand because The Regulation, including the guidance material, does not offer any explicit explanation of what is meant with gross negligence. The reader must know that a definition of gross negligence is not provided in The Regulation but that the definition has deliberately been omitted from Article 2 (definitions) of The Regulation and is 'hidden' in Article 16.10(b).
- …Be easy to understand because every country applies its own national view on gross negligence, based on criteria in the national legal penal code.
- …Be easy to understand because The Regulation, and its guidance material, lacks a taxonomic framework which structures gross negligence in relation to negligence.
- …Be unambiguous because gross negligence, contrary to the view of the EC and the EP, has not been explicitly defined/described in The Regulation and gross negligence has three dimensions: Gross negligence in the context of The Regulation, gross negligence in the context of national criminal law and gross negligence in the context of a corporate just culture policy.
- …Be simple and concise because some Member States do not apply the term gross negligence in their national penal code.
- …Be precise because the adjective 'gross' refers to the noun 'negligence' which is unusable as a reference point because 'negligence' has not been described, nor defined, in The Regulation.

The overview above is far from complete. It is used to share a few examples which confirm that the Regulation cannot offer a uniform protection because what is meant with gross negligence has not been properly described. Therefore, it is legitimate to raise the question whether EU-society really has got what it wanted and expected.

The implementation of The Regulation is not the end of a process. On the contrary, The Regulation and the findings of this study show that European authorities take the balancing between (personal) accountability and safety in complex systems, such as civil aviation, serious. The fact that just culture is anchored in an EU-Regulation is an indication of the recognition that improving safety performance is not something which can be achieved on a national level.

In contrast to criminal law, complex systems, such as the aviation system, do not stop at national borders. If it is the aim to ensure uniform protection in Europe, more European integration is needed. I recognise that more European integration is politically delicate, but that is no reason not to argue for more supranational initiatives.

Notwithstanding that nationalistic forces are increasing their (political) influence in some democratic countries, it is unrealistic to expect that globalisation will be reversed. The tension field between learning lessons from occurrences and administration of justice is also applicable to other complex systems such as other means of transportation, information technology, health care, petrochemical industry, nuclear power, defence systems, cyber security, crimefighting, the financial system and environmental protection. What all these sectors have in common is their global interdependence and a high degree of complexity including phenomenona such as tight coupling which affects the decision-making process of people working in these systems. Or, as described by ICAO: "small changes in one part of the system can lead to large and unexpected effects in the overall system" (ICAO, 2021; p. 1-10).

If safety in a complex system is under pressure, it is an international issue. But if the enforcement of an international issue is left to the Member States, it shouldn't really come as a surprise that an area of tension arises between international - and national interests. The sectors mentioned above bring many advantages for society. Practicing aviation includes the recognition of the willingness to take risk; without 'willingness of risk', there is no aviation. The (obvious) risk, which is inherent in aviation, is a price society has to pay to benefit from the advantages of aviation. From that perspective, there is no reason to prosecute people because they are willing to take 'an obvious risk'.

In order to increase public awareness and - acceptance, it is suggested that initiatives must be taken to apply just culture principles in other domains than civil aviation, such as the Gelli Law in Italy. Integrating the just culture principles in a taxonomic framework of functional immunity can be a first step. By considering just culture as a tier of functional immunity, a commonly known and industry independent, framework can be developed.

It must be acknowledged that simple solutions to achieve a common understanding of gross negligence, and subsequent harmonized protection as referred to in Article 1(b) of The Regulation, do not exist.

'How to proceed from here?' is a legitimate question. I shall take the liberty to share a few possible scenarios which can strengthen a harmonized protection.

The first scenario has a pragmatic approach: Leave The Regulation 'as is', but communicate openly, and discuss, the challenges which prevent the objective to achieve a harmonised protection as referred to in

Article 1(b). As Blomsma argues: "Criminal law is all about communication" (Blomsma, 2012; p. 35). The discussions can be facilitated through workshops, surveys and other different ways at the cost of relatively limited resources. Scenario 1 includes the possibility for Member States to intensify mutual collaboration, such as applying more specifically detailed application of The Regulation, in the absence of a European consensus.

Member States which consider that deeper European integration in the context of a harmonized protection is desirable, need to have the opportunity to further integrate just culture on a multinational level within the existing legal framework of the EU. Other Member States, which opt for a more national approach, maintain that possibility within the scope of The Regulation. Scenario 1 must not be seen as a long-term solution but should rather be considered as an initiative to strengthen trust and confidence of the people who are affected by The Regulation.

Scenario two involves an amendment of The Regulation. In that in the scenario, it is suggested to amend The Definition and perhaps even delete The Definition. An amendment of The Definition is considered as required because The Definition is a literal copy of a corporate definition of just culture, while the context in which The Definition is used is fundamentally different: Corporate use versus being part of the legal order of the EU. In the context of the corporate definition of just culture, Eurocontrol had defined and specified gross negligence in the context of the corporate just culture concept. That might work very well for Eurocontrol, but that does not mean that it will work properly in the legal context of a regulation. The lack of definitions, a terminological framework and a European legal concept, creates ambiguities, vagueness's and indeterminacy at the expense of legal certainty and legal predictability. Another argument to delete The Definition is that just culture, as defined in The Definition, specifies just culture as 'a culture', while it in fact is a legal concept. Scenario 2 fits into a long-term solution which will require significant resources. From the perspective of proportionality, it is very much the question whether there is (political) willingness to finetune just culture principles for the aviation industry only. Furthermore, there is no guarantee that the final result (the amended Regulation) will be more beneficial for the people who are affected by The Regulation than the current version.

The third scenario includes a holistic, industry independent approach of the phenomenon just culture. Scenario 3 integrates just culture principles in risk governance and can be developed in combination with scenario 1, in which scenario 1 must be considered as a temporary solution during the transition time towards the implementation of scenario 3.

Integrating just culture principles in risk governance might be a possibility to let society benefit from just culture in a broader context than civil aviation only. The civil aviation industry will also benefit from the introduction of just culture principles in other industries as it creates a larger playing field for learning and sharing experiences. The question is justified whether the current national legal concepts are adequately prepared for tomorrow's complex society, including tomorrow's aviation system, characterized by its tight (multinational) couplings and interactions caused by the expected, rapid, development of digitalisation, cyber

security, electric aircraft, artificial intelligence, autonomous air traffic management, single pilot solutions and many more.

Implementing just culture in line with scenario 3, will be a revolutionary development which might trigger the modernisation of legal concepts such as negligence. It should not be precluded that new legal concepts must be developed to ensure legal certainty of the next generation, which increasingly will have to do with the aforementioned, developments which have no regard for national borders. In my view, the alignment of legislation cannot be done at a national level because this research confirms Blomsma's point that "the lack of general principles of European criminal law is becoming increasingly problematic" (Blomsma, 2012; p.6).

It will take significant time and resources to develop just culture principles in the context of risk governance as it involves the recognition of the inevitability to adjust society's view on (criminal) accountability in the context of system performance and the role of the human as part of the system. Nevertheless, I see no reason to be pessimistic. Scenario 3 provides the ability to implement just culture principles with a clean slate, taking into account the learning opportunities provided by the implementation of The Regulation. As several studies show, the young generation Europeans feel more positive about the EU, including further EU-integration, than the elder generation Europeans (EenVandaag, 2018; Spratt, 2018; EP, 2019; Bristow, 2020; EC&EP, 2021). I consider that to be an indication that, in the long term, further EU-integration is a natural development. My optimism about further integration in the EU should not be adopted lightly; It is unreasonable to expect that the next generations remain positive about the EU, without the perspective of legal certainty and -predictability.

EASAs encourages that resilience and a safety-2 approach shall be introduced at both service provider and regulatory level in order to better understand the relationship between human factors and human performance in a changing aviation system (EASA, 2021c). ICAOs views that aviation occurrences are usually caused by systemic issues and not by human error (ICAO, 2021). OECD has initiated activities to implement a systems approach for governance, including a systems view of accountability, uncertainty, (systemic) risk management and complexity (OECD, 2017). These are just a few examples of excellent starting points to initiate new chapters into the further development of just culture in the context of risk governance.

The starting point for just culture principles, including the concept for possible culpability should, in my view, be twofold: First, the recognition that occurrences, including (fatal) accidents are unavoidable due to emergence which is inherent to complex systems. Second, the recognition that law is an emergent phenomenon due to the complexity of the legal system and the presence of interactions between the legal system with other systems.

By recognising that emergence is a common denominator of safety and of the administration of justice, I believe that it is impossible to balance safety and administration of justice by 'a clear line', which in a binary way, distinguishes between acceptable and blameworthy behaviour as 'good' versus 'wrong'. It

is in that context, that I hold the view that 'a clear line' that distinguishes acceptable and not acceptable behaviour does not exist. The maximum achievable is a, dynamic, boundary.

The recognition of emergence, by definition, excludes linear approaches such as the doctrine of causation, as an appropriate mean to establish (criminal) accountability on the context of non-intentional occurrences in a sociotechnical system. It is considered that the decision whether to prosecute or not to prosecute, should be preceded by an assessment of human performance. In that assessment, expert-witnesses play a crucial role in the judgement whether prosecution, in the context of just culture principles, is appropriate or not.

In line with ICAOs view on taxonomies future legislation on just culture principles should include a comprehensive, usable, reliable and diagnostic taxonomy to assess human performance (ICAO, 2021). Clear, consistent use of language, communication and transparency about the drafting processes of legal acts are key factors for success. In accordance with the general principles for the drafting of legal acts in the EU, in the future development of just culture the use of ambiguous, vague and indeterminate terms, such as gross negligence as applied in The Regulation, causing inevitable competing discourses at the expense of legal certainty, including legal predictability, must be avoided.

Conclusion

The aim of this research was to answer the research question from a system safety perspective: Is there a common European understanding of gross negligence as cited in the definition of just culture in Regulation (EU) 376/2014?

It was not the aim of this research to criticize sincere initiatives to integrate just culture in EU-legislation. The research is neither about criticizing democratically accepted legal systems and national laws which, by their nature, are anchored in national culture and which deserve great respect. This research proves that there is no common, European, understanding of the term gross negligence, in the context of just culture, as introduced in The Regulation. The absence of a common European understanding of gross negligence is problematic because: Firstly, it makes it impossible to implement a harmonised protection of reporters and persons mentioned in occurrence reports, as claimed in Article 1(b) of The Regulation. Secondly, the absence of harmonised protection causes legal uncertainty which undermines public trust in democratic institutions. Thirdly, effective occurrence reporting depends on trust. The lack of harmonised protection comes at the expense of trust.

This research clarifies multiple aspects (themes) which influence the application of gross negligence as referred to in the definition of just culture of The Regulation. Just culture, safety, EU-integration, public opinion, bureaucracy, judiciary and trust.

In the perspective of The Regulation, a properly functioning just culture is an indispensable element of an integrated European policy to improve aviation safety. The effectiveness of just culture-principles as referred to in Article 16.11 of The Regulation depends, amongst others, on the degree of EU-integration. Public opinion, through democratic elections, ultimately determines the limits of EU-integration. Bureaucracy, on both national- and EU-level, is one of the main causes of the inability to create a common, European, understanding of gross negligence. The area of tension which emerges as a result of the national character of the judiciary, which applies The Regulation in the Member States, versus the international characteristics of both the aviation industry and of The Regulation, can undermine trust in just culture.

The derived themes are related to competing discourses, which obstruct a common European understanding, and application, of gross negligence. The competing discourse with the most significant impact on gross negligence is the competing discourse between national sovereignty and EU-integration.

What is needed to achieve a harmonized protection of reporters and persons mentioned in occurrence reports, is the recognition that the application of the term gross negligence in the definition of just culture is counterproductive unless a common, pan-European, understanding of gross negligence can be achieved. The use of gross negligence is counterproductive because it is useless as a point of reference which objectively describes the boundary of acceptable- and unacceptable behaviour as long as Member States apply their own interpretation of gross negligence based on national law.

Approaching just culture from a broader perspective than aviation only might be beneficial in the process to increase public awareness of, and trust in, the just culture principles. A generic, industry-

independent, approach of just culture can form the foundation of pan-European legislation which aims to improve safety in safety-critical industries in the context of risk governance. 'Thinking out of the box' stimulates creativity and innovation, which are key elements for learning. Just culture principles offer a wealth of unexploited potential for society to improve 'safety' in a large variety of major societal themes. Learning from occurrences can only be achieved in an environment of mutual confidence and trust between the actors involved in the follow-up of unwanted events. It is therefore crucial that it is unequivocally clear under which circumstances reporters, and others mentioned in reports, can count on immunity from prosecution prior to the occurrence of a reportable event. The legal acts which aim to protect reporters must, for that reason, be drafted clearly, simply and precisely. It is fundamental that, in the context of the competing discourse between EU-integration and national sovereignty, Member States show the political willingness to accept short-term (national) pain in the interest of (international) long-term gain.

References

AAIB - Air Accidents Investigation Branch. (2016, September 28). *Shoreham High Court Judgment*. GOV.UK. Retrieved 22 April 2022, from https://www.gov.uk/government/news/shoreham-high-court-judgement

AAIB - Air Accidents Investigation Branch. (2017, March). *AIRCRAFT ACCIDENT REPORT 1/2017 - Report on the accident to Hawker Hunter T7, G-BXFI near Shoreham Airport on 22 August 2015* (No. 1/2017). https://assets.publishing.service.gov.uk/media/58b9247740f0b67ec80000fc/AAR_1-2017_G-BXFI.pdf

Adam, C., Hurka, S., Knill, C., & Steinebach, Y. (2021). On democratic intelligence and failure: The vice and virtue of incrementalism under political fragmentation and policy accumulation. *Governance*. https://doi.org/10.1111/gove.12595

Adams, J. (1995). *Risk* (1st ed.) [E-book]. Routledge.

AIBN - Accident Investigation Board Norway. (2018, July). *REPORT ON THE AIR ACCIDENT NEAR TURØY, ØYGARDEN MUNICIPALITY, HORDALAND COUNTY, NORWAY 29 APRIL 2016 WITH AIRBUS HELICOPTERS EC 225 LP, LN-OJF, OPERATED BY CHC HELIKOPTER SERVICE AS* (SL 2018/04). https://havarikommisjonen.no/Luftfart/Avgitte-rapporter/2018-04

Allyn, J. (2019a, February 18). *Just Culture: Balancing Accountability with Quality and Safety*. RSNA - Radiological Society of North America. Retrieved 24 April 2022, from https://www.rsna.org/news/2019/february/just-culture-background

Allyn, J. (2019b, June 25). *Just Culture Fosters Collaborative, Continuous Learning*. RSNA - Radiological Society of North America. Retrieved 24 April 2022, from https://www.rsna.org/news/2019/June/Expanding-Peer-Learning

Allyn, J. (2019c, April 10). *Peer Learning: Turning Errors into Opportunity*. RSNA - Radiological Society of North America. Retrieved 24 April 2022, from https://www.rsna.org/news/2019/April/peer-learning

ANSV - AGENZIA NAZIONALE PER LA SICUREZZA DEL VOLO. (2008, January). *FINAL REPORT - ACCIDENT INVOLVING ATR 72 AIRCRAFT REGISTRATION MARKS TS-LBB*

ditching off the coast of Capo Galo (Palermo - Sicily) August 6th, 2005. https://reports.aviation-safety.net/2005/20050806-0_AT72_TS-LBB.pdf

Antonsen, S. (2009). *Safety Culture: theory, method and improvement* [E-book]. https://play.google.com/books

Baaij, C. (2015). EU translation and the burden of legal knowledge [E-book]. In S. Šarčević (Ed.), *Language and culture in EU law: multidisciplinary perspectives* (pp. 109–122). Ashgate. Retrieved 22 May 2022, from https://play.google.com/

Baarts, C., Dyreborg, J., Jensen, L., Kines, P., Mikkelsen, K., & Spangenberg, S. (2003). Factors contributing to the differences in work related injury rates between Danish and Swedish construction workers. *Safety Science*, *41*(6), 517–530. https://doi.org/10.1016/s0925-7535(02)00007-3

Baer, S. (2016). Recht als Praxis. Herausforderungen der Rechtsforschung heute. *Zeitschrift Für Rechtssoziologie*, *36*(2). https://doi.org/10.1515/zfrs-2016-0016

Bainbridge, L. (1983). Ironies of automation. *Automatica*, *19*(6), 775–779. https://doi.org/10.1016/0005-1098(83)90046-8

Bajčić, M. (2017). *New Insights into the Semantics of Legal Concepts and the Legal Dictionary* [E-book]. John Benjamins B.V. https://doi.org/10.1075/tlrp.17

Banakar, R., & Travers, M. (2005, November 22). *Introduction to Theory and Method in Socio-Legal Research by Reza Banakar, Max Travers: SSRN*. SSRN -. Retrieved 14 April 2020, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1511112

BBC News. (2019a, February 21). *Shoreham air crash trial: G-force 'may have impaired pilot'*. Retrieved 12 March 2022, from https://www.bbc.com/news/uk-england-sussex-47324182

BBC News. (2019b, March 8). *Shoreham Airshow crash pilot acquitted over deaths*. Retrieved 12 March 2022, from https://www.bbc.com/news/uk-england-47495885

BBC News. (2022, February 4). *Shoreham air crash inquests: Coroner denied use of cockpit footage*. Retrieved 12 March 2022, from https://www.bbc.com/news/uk-england-sussex-60267730

BEA - Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile. (2002, January). *Accident on 25 July 2000 at La Patte d'Oie in Gonesse (95) to the Concorde registered F-BTSC operated by Air France* (f-sc000725a). https://bea.aero/uploads/tx_elydbrapports/f-sc000725a.pdf

BEA - Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile. (2012, July). *Final Report On the*

accident on 1st June 2009 to the Airbus A330-203 registered F-GZCP operated by Air France flight AF 447 Rio de Janeiro - Paris. https://www.bea.aero/docspa/2009/f-cp090601.en/pdf/f-cp090601.en.pdf

BEA - Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile. (2013, August). *Study on Aeroplane State Awareness during Go-Around*. https://www.bea.aero/etudes/asaga/asaga.study.pdf

Best, J. (2012). Bureaucratic ambiguity. *Economy and Society*, *41*(1), 84–106. https://doi.org/10.1080/03085147.2011.637333

BFU - German Federal Bureau of Aircraft Accident Investigation. (2016, October). *Investigation Report* (BFU 15–1354-AX). https://www.bfu-web.de/EN/Publications/Investigation%20Report/2015/Report_15-1354-AX_DHC8_Saarbrucken.pdf?__blob=publicationFile

Bieder, C., & Bourrier, M. (2013). *Trapping Safety Into Rules* [E-book]. Ashgate. Retrieved 29 May 2022, from https://play.google.com/books/

Bijlsma, A. (2013). Justice and safety. *Hindsight*, *18*, 62–65. https://skybrary.aero/sites/default/files/bookshelf/2576.pdf

Blomsma, J. (2012). *Mens rea and defences in European criminal law*. Jeroen Blomsma.

Bosk, C. (2003). *Forgive and Remember: Managing Medical Failure, 2nd Edition* (2nd ed.). The University of Chicago Press.

Bratanić, M., & Lončar, M. (2015). The myth of EU terminology harmonization on national and EU level [E-book]. In S. Šarčević (Ed.), *Language and culture in EU law: multidisciplinary perspectives* (pp. 207–218). Ashgate. Retrieved 22 May 2022, from https://play.google.com/books/

Bristow, J. (2020). Post-Brexit Boomer blaming: The contradictions of generational grievance. *The Sociological Review*, *69*(4), 759–774. https://doi.org/10.1177/0038026119899882

Busch, C. (2016). *Safety Myth 101: Musings on Myths, Misunderstandings and More*. Mind The Risk.

Busch, C. (2021). *The First Rule of Safety Culture: A Counter-C-Word Manifesto* [E-book]. Mind the Risk.

CAA. (2011, March). *CAA 'Significant Seven' Task Force Reports* (CAA PAPER 2011/03). https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=4452

CAE. (2022, May 1). *B737 Captain European bases*. Retrieved 1 May 2022, from https://www.cae.com/civil-

aviation/aviation-jobs/find-a-job/b737-captain-european-bases-25352

Coscia. (2020, March 19). *Medical liability after the reform implemented by the Law "Gelli-Bianco".* Studio Legale Coscia. Retrieved 29 May 2022, from https://studiolegalecoscia.it/en/compensation-for-damages-deriving-from-medical-or-professional-liability/la-responsabilita-medica-dopo-la-riforma-attuata-dalla-legge-gelli-bianco

Cotterrell, R. (2009). Spectres of Transnationalism: Changing Terrains of Sociology of Law. *Journal of Law and Society*, *36*(4), 481–500. https://doi.org/10.1111/j.1467-6478.2009.00480.x

Courteney, H. (2020). Reducing vulnerability to human error: a total systems approach. *The Human Dimension in Tomorrow's Aviation System*, 38–39. https://ergonomics.org.uk/resource/tomorrows-aviation-system.html#:~:text=Ideas%20and%20challenges%20about%20how,generation%20technology%20for%20virtual%20cockpits.

Creswell, J. & Poth, C. (2018). *Qualitative Inquiry and Research Design* [E-book]. SAGE Publications. Retrieved 22 May 2022, from https://play.google.com/books/

Cromie, S. & Bott, F. (2016). Just culture's "line in the sand" is a shifting one, an empirical investigation of culpability determination. *Safety Science*, *86*, 258–272. https://doi.org/10.1016/j.ssci.2016.03.012

Cupelli, C. (2017). The Criminal Liability of the Healthcare Professionals and the New Law No. 24/2017. *News from Legislation and Case Law, 4,* 200-216. https://dpc-rivista-trimestrale.criminaljusticenetwork.eu/pdf/DPC_Riv_Trim_4_17_Cupelli.pdf

Daniels, S. (2017). *Corporate Manslaughter in the Maritime and Aviation Industries* [E-book]. Retrieved 29 April 2022, from https://play.google.com/books

Dawson, C. (2009). *Introduction to Research Methods* [E-book]. Little, Brown Book Group.

Dekker, S. (2011). *Patient Safety* [E-book]. https://play.google.com/books

Dekker, S. (2015). *Safety Differently: Human Factors for a New Era, Second Edition* (2nd ed.). CRC Press.

Dekker, S. (2017). *Just Culture: Restoring Trust and Accountability in Your Organization, Third Edition* (3rd ed.). CRC Press.

Dekker, S. W. (2002). Reconstructing human contributions to accidents: the new view on error and performance. *Journal of Safety Research*, *33*(3), 371–385. https://doi.org/10.1016/s0022-

4375(02)00032-4

Dekker, S. W. (2006). *The Field Guide to Understanding Human Error* [E-book]. Ashgate.

Dekker, S. W. (2011). *Drift into Failure: From Hunting Broken Components to Understanding Complex Systems* [E-book]. CRC Press.

Dekker, S. W. (2019). *Foundations of Safety Science: A Century of Understanding Accidents and Disasters* (1st ed.) [E-book]. Routledge.

Dismukes, K., Berman, B. A., & Loukopoulos, L. (2007). *The Limits of Expertise* [E-book]. Ashgate.

dos Santos, J. (2013, December). Just culture versus criminalization - moving forward. *Hindsight*, *18*. Retrieved 29 March 2022, from https://skybrary.aero/sites/default/files/bookshelf/2569.pdf

EASA - European Union Aviation Safety Agency. (2014, August). *A Harmonised European Approach to a Performance Based Environment* (FO.GEN.00400-003). https://www.easa.europa.eu/downloads/17621/en

EASA - European Union Aviation Safety Agency. (2021c, December). *THE EUROPEAN PLAN FOR AVIATION SAFETY (EPAS 2022–2026) - Volume I - Introduction & Strategy*. https://www.easa.europa.eu/downloads/134918/en

EC - European Commission. (2012, December 18). *Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on occurrence reporting in civil aviation amending Regulation (EU) No 996/2010 and repealing Directive No 2003/42/EC, Commission Regulation (EC) No 1321/2007 and Commission Regulation (EC) No 1330/2007*. EUR-Lex. Retrieved 8 March 2022, from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52012PC0776

EC - European Commission. (2015a, June). *COMMISSION IMPLEMENTING REGULATION (EU) 2015/1018 of 29 June 2015 laying down a list classifying occurrence in civil aviation to be mandatorily reported according to Regulation (EU) No 376/2014 of the European Parliament and of the Council*. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R1018&qid=1647267229312&from=EN

EC - European Commission. (2015b, December). *GUIDANCE MATERIAL REGULATION (EU) NO 376/2014 ON THE REPORTING, ANALYSIS AND FOLLOW-UP OF OCCURRENCES IN CIVIL AVIATION COMMISSION IMPLEMENTING REGULATION (EU) 2015/1018*

LAYING DOWN A LIST CLASSIFYING OCCURRENCES IN CIVIL AVIATION TO BE MANDATORILY REPORTED. https://aviationreporting.eu/sites/default/files/2020-04/Guidancematerial376-2014.pdf

EC - European Commission. (2021, February). *COMMISSION STAFF WORKING DOCUMENT EVALUATION of Regulation (EU) No 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation* ({SWD (2021) 31 final}). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021SC0030

EC - European Commission & EP - European Parliament. (2021). *Special Eurobarometer 517 - Report - Future of Europe* (No. 517). https://webgate.ec.europa.eu/ebsm/api/public/deliverable/download?doc=true&deliverableId=79911#page11

ECB – European Central Bank. *Legal Working Paper Series* (No. 4). https//www.ecb.europa.eu/pub/pdf/scplps/ecblwp4.pdf

EenVandaag. (2018, June 28). *De EU: een clash of generations*. Retrieved 16 April 2022, from https://eenvandaag.avrotros.nl/amp/de-eu-een-clash-of-generations/

EESC - European Economic and Social Committee. (2013, July 10). *Opinion of the European Economic and Social Committee on the 'Proposal for a Regulation of the European Parliament and of the Council on occurrence reporting in civil aviation amending Regulation (EU) No 996/2010 and repealing Directive 2003/42/EC, Commission Regulation (EC) No 1321/2007 and Commission Regulation (EC) No 1330/2007'*. Legislative Observatory European Parliament. Retrieved 8 March 2022, from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013AE0926&from=EN

Eliassen, H. (2018, October 23). *Henlegger Turøy-saken*. TV 2. Retrieved 30 April 2022, from https://www.tv2.no/a/10161952/

EP - European Parliament. (2009, August). *European Parliament recommendation of 7 May 2009 to the Council on development of an EU criminal justice area (2009/2012(INI)*. Official Journal of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009IP0386&from=EN

EP - European Parliament. (2013, June 18). *DRAFT REPORT on the proposal for a Regulation of the European Parliament and of the Council on occurrence reporting in civil aviation amending Regulation (EU) No 996/2010*

and repealing Directive No 2003/42/EC, Commission Regulation (EC) No 1321/2007 and Commission Regulation (EC) No 1330/2007. European Parliament. Retrieved 8 March 2022, from https://www.europarl.europa.eu/doceo/document/TRAN-PR-510864_EN.html

EP - European Parliament. (2019, September 24). *2019 European elections: Record turnout driven by young people | News | European Parliament* [Press release]. https://www.europarl.europa.eu/news/en/press-room/20190923IPR61602/2019-european-elections-record-turnout-driven-by-young-people

ERA - EUROPEAN UNION AGENCY FOR RAILWAYS. (2019, August). *COR - Just Culture and Liability* (ERA-PGR-004-5). https://www.era.europa.eu/sites/default/files/activities/docs/cor_paper_on_just_culture_and_liability_en.pdf

EU - European Union. (2012, October). *CONSOLIDATED VERSION OF THE TREATY ON EUROPEAN UNION*. https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF

EU - European Union. (2015). *Joint Practical Guide of the European Parliament, the Council and the Commission for persons involved in the drafting of European Union legislation*. https://op.europa.eu/en/publication-detail/-/publication/3879747d-7a3c-411b-a3a0-55c14e2ba732

EU - European Union. (n.d.). *Types of legislation*. Types of Legislation. Retrieved 9 March 2022, from https://european-union.europa.eu/institutions-law-budget/law/types-legislation_en

EU - European Union. (2014, April 24). *REGULATION (EU) No 376/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, amending Regulation (EU) No 996/2010 of the European Parliament and of the Council and repealing Directive 2003/42/EC of the European Parliament and of the Council and Commission Regulations (EC) No 1321/2007 and (EC) No 1330/2007*. EUR-Lex. Retrieved 8 March 2022, from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014R0376

Eurocontrol. (2005, October). *SAFREP - Safety Data Reporting and Data Flow Task Force - Report on ATM Incident Reporting Culture: Impediments and Practices* (Issue 1.0). https://www.era.europa.eu/sites/default/files/events-news/docs/safrep_2005_just_culture_en.pdf

Eurocontrol. (2006). *ESTABLISHMENT OF 'JUST CULTURE' PRINCIPLES IN ATM SAFETY*

DATA REPORTING AND ASSESSMENT.

https://www.skybrary.aero/bookshelf/books/235.pdf

FCS - The Federal Council of Switzerland. (2022, January 1). *Swiss Criminal Code*. Fedlex - The Publication Platform for Federal Law. Retrieved 17 March 2022, from https://www.fedlex.admin.ch/eli/cc/54/757_781_799/en

Fidrmuc, J., Ginsburgh, V., & Weber, S. (2009). Voting on the choice of core languages in the European Union. *European Journal of Political Economy*, *25*(1), 56–62. https://doi.org/10.1016/j.ejpoleco.2008.07.002

Fieldfisher. (2019, March 15). *Shoreham Airshow pilot acquitted of gross negligence manslaughter at Old Bailey*. Retrieved 22 May 2022, from https://www.fieldfisher.com/en/services/dispute-resolution/health-and-safety/health-safety-law-blog/shoreham-airshow-pilot-acquitted-of-gross-negligence-manslaughter-at-old-bailey

Frijns, B., Hubers, F., Kim, D., Roh, T. Y., & Xu, Y. (2022). National culture and corporate risk-taking around the world. *Global Finance Journal*, *52*, 100710. https://doi.org/10.1016/j.gfj.2022.100710

FSF - FLIGHT SAFETY FOUNDATION. (n.d.-c). *ASN Aircraft accident de Havilland Canada DHC-8-402Q Dash 8 LX-LGH SaarbrÃ¼cken-Ensheim Airport (SCN)*. AVIATION SAFETY NETWORK. Retrieved 18 April 2022, from https://aviation-safety.net/database/record.php?id=20150930-0

FSF - Flight Safety Foundation. (2009, February 27). *Dutch Safety Board refuses Public Prosecutor access to CVR/FDR data*. Aviation Safety Network. Retrieved 18 April 2022, from https://news.aviation-safety.net/2009/02/27/dutch-safety-board-refuses-public-prosecutor-access-to-cvrfdr-data/

GAIN - GLOBAL AVIATION SAFETY NETWORK. (2004, September). *A ROADMAP TO A JUST CULTURE: ENHANCING THE SAFETY ENVIRONMENT* (No. 1). https://skybrary.aero/sites/default/files/bookshelf/233.pdf

Gibbs, G. (2007). *The Sage Qualitative Research Kit* [E-book]. SAGE Publications.

Glavin, R. J. (2011). Human performance limitations (communication, stress, prospective memory and fatigue). *Best Practice & Research Clinical Anaesthesiology*, *25*(2), 193–206. https://doi.org/10.1016/j.bpa.2011.01.004

Grbich, C. (2013). *Qualitative Data Analysis* [E-book]. SAGE Publications.

Griffiths, J. (2017). What is sociology of law? (On law, rules, social control and sociology). *The Journal of Legal Pluralism and Unofficial Law*, *49*(2), 93–142. https://doi.org/10.1080/07329113.2017.1340057

Grose, V. (2013). Aircraft Flight Data Recorders. *Encyclopedia of Forensic Sciences,* 327-334. https://doi.org/10.1016/b978-0-12-382165-2.00129-x

Gross, J. (2018). Document Analysis. In B. Frey (Ed), *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation* (pp. 545-548). SAGE Publications, Inc. https://doi.org/10.4135/9781506326139.n209

Gurney, J. (2015). DRIVING INTO THE UNKNOWN: EXAMINING THE CROSSROADS OF CRIMINAL LAW AND AUTONOMOUS VEHICLES. *WAKE FOREST JOURNAL OF LAW & POLICY*, *5*(2), 393–442.

Harding, J. (2013). *Qualitative Data Analysis from Start to Finish* [E-book]. SAGE Publications.

Hawkins, F. (2017). *Human Factors in Flight* [E-book]. Taylor & Francis.

Heine, P. (2017, March 22). *Ermittlungen gegen Luxair Co-Pilotin eingestellt*. Saarbrücker Zeitung. Retrieved 18 April 2022, from https://www.saarbruecker-zeitung.de/saarland/saarbruecken/saarbruecken/saarbruecken/ermittlungen-gegen-luxair-co-pilotin-eingestellt_aid-1768107

Hirsch, M. (2015). *Invitation to the Sociology of International Law* [E-book]. https://play.google.com/books

Hockey, G. (1997). Compensatory control in the regulation of human performance under stress and high workload: A cognitive-energetical framework. *Biological Psychology*, *45*(1–3), 73–93. https://doi.org/10.1016/s0301-0511(96)05223-4

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and Organizations - Software of the Mind*. McGraw-Hill Education.

Hollnagel, E. (2002). *Understanding Accidents - From Root Causes to Performance Variability*. IEEE 7Th Human Factors Meeting, Scottsdale, Arizona, USA. https://ieeexplore.ieee.org/abstract/document/1042821

Hollnagel, E. (2008). The Changing Nature of Risks. *Ergonomics Australia*, *22*(1–2), 33–46.

Hollnagel, E. (2009). *The ETTO Principle: Efficiency-Thoroughness Trade-Off: Why Things That Go Right Sometimes Go Wrong*. Ashgate Publishing Limited.

Hollnagel, E. (2013). Is justice really important. *Hindsight*, *18*, 10–13. https://skybrary.aero/sites/default/files/bookshelf/2559.pdf

Hollnagel, E. (2014). *Safety-I and Safety-II* [E-book]. https://play.google.com/books

Hollnagel, E., & Amalberti, R. (2001). *The Emperor's New Clothes or Whatever Happened To "Human Error"?* HESSD - Human Error, Safety and Systems Development, Linköping, Sweden. https://www.ida.liu.se/~769A09/Literature/Human%20Error/Hollnagel,%20Amalberti_2001.pdf

Hollnagel, E., & Woods, D. D. (2005). *Joint Cognitive Systems: Foundations of Cognitive Systems Engineering* (1st ed.). CRC Press.

Hoogduin, L. (2017). Complexity, modesty and economic policy. In P. Love & J. Stockdale -Otárola (Eds.), *Debate the Issues: Complexity and policy making* (OECD Insights ed., pp. 49–51). OECD Insights, Paris. https://doi.org/10.1787/9789264271531-en

Hynes, W., Lees, M., & Müller, J. (Eds.). (2020). Systemic Thinking for Policy Making. *New Approaches to Economic Challenges*. https://doi.org/10.1787/879c4f7a-en

IATA. (2017). *Unstable Approaches - Risk Mitigation Policies, Procedures and Best Practices 3rd Edition*. https://www.iata.org/contentassets/7a5cd514de9c4c63ba0a7ac21547477a/iata-guidance-unstable-approaches.pdf

IATA - International Air Transport Association. (2016, February). *Just culture can improve safety | Airlines.* Just Culture Can Improve Safety. Retrieved 1 May 2022, from https://airlines.iata.org/analysis/just-culture-can-improve-safety

ICAO - INTERNATIONAL CIVIL AVIATION ORGANIZATION. (2004). *HUMAN FACTORS DIGEST - CIRCULAR 302-AN/175* (No. 16). https://portal.icao.int/icao-net/Circulars/302_en.pdf

ICAO - International Civil Aviation Organization. (2021). *Doc 10151 - Manual on Human Performance (HP) for Regulators* (First Edition). https://www.icao.int/safety/OPS/OPS-Section/Documents/Advance-unedited.Doc.10151.alltext.en.pdf

IRGC - International Risk Governance Council. (2010). *The Emergence of Risks: Contributing Factors*. https://irgc.org/wp-content/uploads/2018/09/irgc_ER_final07jan_web.pdf

Kanki, B. G. (2018). Cognitive functions and human error. *Space Safety and Human Performance*, 17–52.

https://doi.org/10.1016/b978-0-08-101869-9.00002-9

Keiler, J. (2013). *Actus reus and participation in European criminal law*. Intersentia. https://doi.org/10.26481/dis.20130412jk

Kirk, J., & Miller, M. L. (1986). *Reliability and Validity in Qualitative Research* [E-book]. SAGE Publications.

Kirman, A. (2017). Complexity and economic policy. In P. Love & J. Stockdale - Otárola (Eds.), *Debate the Issues: Complexity and policy making* (OECD Insights ed., pp. 36–38). OECD Publishing, Paris. https://doi.org/10.1787/9789264271531-en

KIWA. (2022). *Part-FCL piloten*. Veelgestelde Vragen over de Part-FCL Voor Piloten. Retrieved 30 April 2022, from https://www.kiwaregister.com/veelgestelde-vragen/piloten

Kjær, A. L. (2015). Theoretical Aspects of Legal Translation in the EU: The Paradoxical Relationship between Language, Translation and the Autonomy of EU Law [E-book]. In S. Šarčević (Ed.), *Language and Culture in EU Law, Multidisciplinary Perspectives* (pp. 91–108).

Knill, C., Steinbacher, C., & Steinebach, Y. (2020). Balancing Trade-Offs between Policy Responsiveness and Effectiveness: The Impact of Vertical Policy-Process Integration on Policy Accumulation. *Public Administration Review*, *81*(1), 157–160. https://doi.org/10.1111/puar.13274

Kortleven, W. (2013). *Voorzorg in Nederland - Ontwikkelingen in de maatschappelijke omgang met kindermishandeling, verkeersonveiligheid en genetische modificatie*. Wolf Legal Publishers.

Kováčová, M., Licu, A., & Bálint, J. (2019). Just Culture – Eleven Steps Implementation Methodology for organisations in civil aviation – "JC 11". *Transportation Research Procedia*, *43*, 104–112. https://doi.org/10.1016/j.trpro.2019.12.024

Kruse, G. (2016, December 1). *Abschlussbericht zum Luxair-Unfall in Saarbrücken liegt vor*. airliners.de. Retrieved 18 April 2022, from https://www.airliners.de/abschlussbericht-luxair-unfall-saarbruecken/40184

Lammersen, F., & da Silva, J. (2017). Development as the outcome of a complex adaptive system. In P. Love & J. Stockdale - Otárola (Eds.), *Debate the Issues: Complexity and policy making* (OECD Insights ed., pp. 87–89). OECD Publishing, Paris. https://doi.org/10.1787/9789264271531-en

LaPorte, T., & Consolini, P. (1991). Working in Practice But Not in Theory: Theoretical Challenges of "High-Reliability Organizations". *Journal of Public Administration Research and Theory, 1*(1), 19-48.

https://doi.org/10.1093/oxfordjournals.jpart.a037070

Leveson, N. (2011). Applying systems thinking to analyse and learn from events. *Safety Science,* 49(1), 55-64. https://doi.org/10.1016/j.ssci.200912.021

Licu, T., & van Dam, R. (2013). Just culture in aviation: dynamics and deliverables. *Hindsight*, *18*, 18–21. https://skybrary.aero/articles/hindsight-18

LoPucki, M. (1997). Systems Approach to Law. *Cornell Law Review, 82* (3), 479-522. https://core.ac.uk/download/pdf/216738368.pdf

Loveless, J. (2016). *Complete Criminal Law*. Oxford University Press.

LV - LATVIJAS VĒSTNESIS - The official publisher of the Republic of Latvia. (2021, November 11). *Krimināllikums*. LIKUMI.LV. Retrieved 17 March 2022, from https://likumi.lv/ta/en/en/id/88966

Mandrick, K., Peysakhovich, V., Rémy, F., Lepron, E., & Causse, M. (2016). Neural and psychophysiological correlates of human performance under stress and high mental workload. *Biological Psychology*, *121*, 62–73. https://doi.org/10.1016/j.biopsycho.2016.10.002

Martins, I. T., Martins, E. T., Soares, M. M., & da Silva Augusto, L. G. (2013). Human Error in Aviation: The Behavior of Pilots Facing the Modern Technology. *Design, User Experience, and Usability. User Experience in Novel Technological Environments*, 150–159. https://doi.org/10.1007/978-3-642-39238-2_17

McGregor, S. L. T. (2019). *Understanding and evaluating research* [E-book]. SAGE Publications.

Michaelides-Mateou, S., & Mateou, A. (2016). *Flying in the Face of Criminalization* [E-book]. Routledge.

Mittal, S., Diallo, S., & Tolk, A. (2018). *Emergent Behavior in Complex Systems Engineering* [E-book]. Wiley.

Moriarty, D., & Jarvis, S. (2014). A systems perspective on the unstable approach in commercial aviation. *Reliability Engineering & System Safety*, *131*, 197–202. https://doi.org/10.1016/j.ress.2014.06.019

Moore, M. (2019, October 3). *Causation in the Law (Stanford Encyclopedia of Philosophy)*. Stanford Encyclopedia of Philosophy. Retrieved 27 May 2022, from https://plato.stanford.edu/entries/causation-law/#DomiDefiProxCaus

OECD. (2017). *OECD Insights Debate the Issues: Complexity and Policy making* (P. Love & J. Tockdale - Otárola, Eds.). OECD Publishing. https://www.oecd-ilibrary.org/economics/debate-the-issues-complexity-and-policy-making_9789264271531-en

Panelli, S., & Scarabello, M. (2013). Why is it necessary to criminalise negligent behavior? *Hindsight*, *18*, 58–61. https://skybrary.aero/sites/default/files/bookshelf/2575.pdf

Pellegrino, F. (2019). *The Just Culture Principles in Aviation Law* [E-book]. https://doi.org/10.1007/978-3-030-23178-1

Perrow, C. (1999). *Normal Accidents*. Princeton University Press.

Politiet. (2018). *Statsadvokaten henlegger Turøy-saken* [Press release]. https://www.politiet.no/

Ramos, G. (2017). It's not just the economy: Society is a complex system too. In P. Love & J. Stockdale-Otárola (Eds.), *Debate the Issues: Complexity and policy making* (OECD Insights ed., pp. 17–20). OECD Publishing, Paris. https://doi.org/10.1787/9789264271531-en

Rasmussen, J. (1982). Human errors. A taxonomy for describing human malfunction in industrial installations. *Journal of Occupational Accidents*, *4*(2–4), 311–333. https://doi.org/10.1016/0376-6349(82)90041-4

Rasmussen, J. (1983). Skills, rules, and knowledge; signals, signs, and symbols, and other distinctions in human performance models. *IEEE Transactions on Systems, Man, and Cybernetics*, *SMC-13*(3), 257–266. https://doi.org/10.1109/tsmc.1983.6313160

Rasmussen, J. (1997). Risk management in a dynamic society: a modelling problem. *Safety Science, 27*(2-3), 183-213. https://doi.org/10.1016/s0925-7535(97)00052-0

Read, G. J. M., Shorrock, S., Walker, G. H., & Salmon, P. M. (2021). State of science: Evolving perspectives on 'human error'. *Ergonomics*, *64*(9), 1091–1114. https://doi.org/10.1080/00140139.2021.1953615

Reason, J. (1990). *Human Error* (1st ed.) [E-book]. Cambridge University Press.

Reason, J. (1997). *Managing the Risks of Organizational Accidents* (1st ed.). Ashgate

Reason, J. (2000). Human error: models and management. *Western Journal of Medicine, 172*(6), 393-396. https://doi.org/10.1136/ewjm.172.6.393

Reiman, T., & Rollenhagen, C. (2014). Does the concept of culture help or hinder systems thinking in safety? *Accident Analysis & Prevention, 68,* 5-15. https://doi.org/10.1016/j.aap.2013.10.033

Robertson, C. (2015). EU multilingual law: interfaces of law, language and culture [E-book]. In S. Šarčević (Ed.), *Language and culture in EU law: multidisciplinary perspectives* (pp. 33–52). Ashgate. Retrieved 22 May

2022, from https://play.google.com/books/

Rundmo, T. (1996). Associations between risk perception and safety. *Safety Science*, *24*(3), 197–209. https://doi.org/10.1016/s0925-7535(97)00038-6

SAIA - Swedish Accident Investigation Authority. (2016, December). *Final report RL 2016:11e Accident in Oajevágge, Norrbotten County, Sweden on 8 January 2016 involving the aeroplane SE-DUX of the model CL-600-2B19, operated by West Atlantic Sweden AB* (L 01/16). https://www.havkom.se/assets/reports/RL-2016_11e.pdf

Šarčević, S. (2015). Basic principles of term formation in the multilingual and multicultural: Context of EU law [E-book]. In S. Šarčević (Ed.), *Language and culture in EU law: multidisciplinary perspectives* (pp. 183–205). Ashgate. Retrieved 22 May 2022, from https://play.google.com/books/

Schubert, F. (2013, December). A just culture in aviation - who is an expert? *Hindsight*, *18*. Retrieved 29 March 2022, from https://skybrary.aero/sites/default/files/bookshelf/2571.pdf

Siegrist, M., & Árvai, J. (2020). Risk Perception: Reflections on 40 Years of Research. *Risk Analysis*, *40*(S1), 2191–2206. https://doi.org/10.1111/risa.13599

Shkedi, A. (2004). Second-order theoretical analysis: a method for constructing theoretical explanation. *International Journal of Qualitative Studies in Education, 17(5),* 627-646. http://doi.org/10.1080/0951839042000253630

Slager, S. (2009, February 27). *Twee partijen, met ieder een eigen belang*. Trouw. Retrieved 18 April 2022, from https://www.trouw.nl/nieuws/twee-partijen-met-ieder-een-eigen-belang~b6c018ed/

Slovic, P. (2016). *The Perception of Risk* [E-book]. https://www.amazon.com/Perception-Risk-Earthscan-Society-ebook/

Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative Phenomenological Analysis: Theory, Method and Research* (1st ed.) [E-book]. SAGE Publications Ltd.

Snook, S. (2002). *Friendly Fire: The Accidental Shootdown of U.S. Black Hawks over Northern Iraq* (Rev. ed.). Princeton University Press.

Spratt, V. (2018, October 5). *The truth about young people and Brexit*. BBC Three. Retrieved 16 April 2022, from https://www.bbc.co.uk/bbcthree/article/b8d097b0-3ad4-4dd9-aa25-af6374292de0

Stoop, J., & Dekker, S. (2012). Are safety investigations pro-active? *Safety Science*, *50*(6), 1422–1430.

https://doi.org/10.1016/j.ssci.2011.03.004

Sutcliffe, K. & Weick, K. (2015). *Managing the Unexpected* (3rd edition). Wiley.

Swedish Research Council. (2017). *GOOD RESEARCH PRACTICE*. https://www.vr.se/download/18.5639980c162791bbfe697882/1555334908942/Good-Research-Practice_VR_2017.pdf

Tamanaha, B. (2018). Law's Evolving Emergent Phenomena: From Rules of Social Intercourse to Rule of Law Society. *Law Review*, *95*(5). https://openscholarship.wustl.edu/law_lawreview/vol95/iss5/11/

Thompson, C. B., & Walker, B. (1998). Basics of research (Part 12): Qualitative research. *Air Medical Journal*, *17*(2), 65–70. https://doi.org/10.1016/s1067-991x(98)90022-0

Trögeler, M. (2011). *The criminalisation of air accidents and the creation of a just culture*. https://eala.aero/wp-content/uploads/2014/05/Mildred-Tr%c3%aegeler-EALA-prize.pdf

Vago, S. (2011). *Law and Society* (10th edition). Prentice Hall.

Van der Jeught, S. (2018). Current practises with regard to the interpretation of multilingual EU LAW: How to deal with diverging language versions? *European Journal of Legal Studies, II*(I), 5-33. https://heinonline-org.ludwig.lub.lu.se/HOL/Print?collection=journals&handle=hein.journals/ejls11&id=9

Vaughan, D. (2016). *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA, Enlarged Edition.* University of Chicago Press.

Viellechner, L. (2016). The Limits of Law (and Democracy) in the Euro Crisis: An Approach from Systems Theory. *German Law Journal, 17*(5), 747-762. https://doi.org/10.1017/s2071832200021441

Vink, L. J. (2017). *Experts in Disaster*. Communicatiereeks.

Wessel, R. A. (2014). Immunities of the European Union. *International Organizations Law Review, 10*(2), 395-418. https://doi.org/10.1163/15723747-01002009

Woodlock, J., & Hydén, H. (2020). (f)Lex avionica; How soft law serves as an instrumental mediator between professional norms and the hard law regulation of European civil aviation maintenance. *Safety Science*, *121*, 54–63. https://doi.org/10.1016/j.ssci.2019.08.037

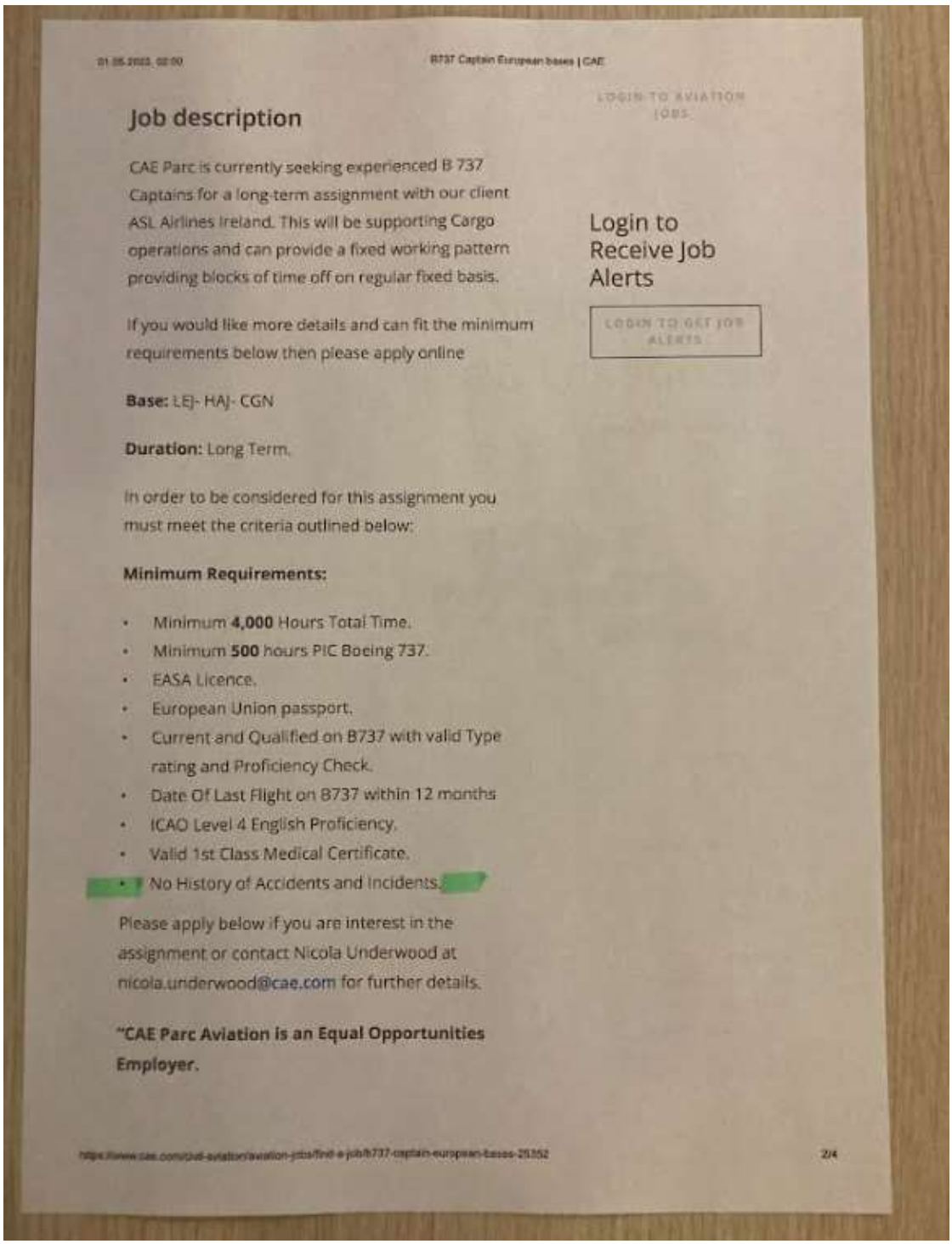
Woods, D., & Cook, R. (1999). Perspectives on Human Error: Hindsight Bias and Local Rationality. In F. Durso, R. Nickerson, R. Schvaneveldt, S. Dumais, D. Lindsay, M. Chi, & R. Cook (Eds.), *Handbook*

of Applied Cognition (pp. 141–171). John Wiley & Sons Ltd.

Woods, D. D., Dekker, S., Cook, R., Johannesen, L., & Sarter, N. (2010). *Behind Human Error* (2nd ed.). CRC Press.

Yilmaz, A. (2019). Strategic approach to managing human factors risk in aircraft maintenance organization: risk mapping. *Aircraft Engineering and Aerospace Technology*, *91*(4), 654–668. https://doi.org/10.1108/aeat-06-2018

Appendix A - Example requirement of 'no accident, no incident history', 2022:



01.05.2022, 02:00 B737 Captain European bases | CAE

Job description

LOGIN TO AVIATION JOBS

CAE Parc is currently seeking experienced B 737 Captains for a long-term assignment with our client ASL Airlines Ireland. This will be supporting Cargo operations and can provide a fixed working pattern providing blocks of time off on regular fixed basis.

If you would like more details and can fit the minimum requirements below then please apply online

Base: LEJ- HAJ- CGN

Duration: Long Term.

In order to be considered for this assignment you must meet the criteria outlined below:

Minimum Requirements:

- Minimum **4,000** Hours Total Time.
- Minimum **500** hours PIC Boeing 737.
- EASA Licence.
- European Union passport.
- Current and Qualified on B737 with valid Type rating and Proficiency Check.
- Date Of Last Flight on B737 within 12 months
- ICAO Level 4 English Proficiency.
- Valid 1st Class Medical Certificate.
- No History of Accidents and Incidents.

Please apply below if you are interest in the assignment or contact Nicola Underwood at nicola.underwood@cae.com for further details.

"CAE Parc Aviation is an Equal Opportunities Employer.

Login to Receive Job Alerts

LOGIN TO GET JOB ALERTS

https://www.cae.com/civil-aviation/aviation-jobs/find-a-job/b737-captain-european-bases-25352 2/4

Appendix B - Request form no incident/ no accident declaration (Kiwa, 2022)

How can a verification letter and/or a no incident/accident statement be requested?

Providing a verification letter is a service for which we charge a fee (/en-gb/part-fcl-licence-for-pilots) since 1 November 2017. The verification letter can be requested by the pilot, airline or aviation authority. The request can be submitted via the contact form (/en-gb/contact) stating the address that must be mentioned on the invoice.
The verification letter states your name, date of birth, licence number and all valid ratings. The verification letter also includes a no-incident/accident declaration.

The no-incident/accident declaration can be requested by the pilot, airline or aviation authority. This is also a service for which a fee is requested since 1 November 2017. The valid ratings are not stated in this.

Appendix C - Example of no incident/ no accident declaration:

Human Environment and Transport
Inspectorate
Ministry of Infrastructure and Water Management

kiwa

Kiwa Register B.V.
P.O Box 4
2280 AA RIJSWIJK (Zuid-Holland)
The Netherlands

NL.luchtvaart@kiwa.nl
www.kiwaregister.nl

Subject: Verification
Information: Unit Operations & IT
Date: 30 April 2021
Our reference: [redacted]

TO WHOM IT MAY CONCERN

It is hereby certified that Mr. [redacted] is holder of a Dutch Part-FCL CPL(A) licence, issued on [redacted] with licence no. NL.FCL.[redacted] with the following ratings:

- SEP (land)	**- IR**	**Valid until [redacted]**
- LPE English level 6		**Always valid**
- RT (in English)		**Always valid**
- Night(A)		**Always valid**

While flying with a Dutch licence the personal file at Kiwa Register shows no record of any incident, accident or misconduct.

Sincerely,

The Minister of Infrastructure and Water Management
by:
The chairman of the management board of Kiwa N.V.
by:

[redacted]

Human Environment and Transport Inspectorate

Appendix D – Background of the informants:

Informant 1 (interview A):

- Role in just culture: Informant is a safety manager representing the aviation sector
- Informant was involved in the introduction of The Regulation

Informant 2 (interview B):

- Role in just culture: None
- Informant was not involved in the introduction of The Regulation

Informant 3 (interview C):

- Role in just culture: Informant represents employees of the aviation sector
- Informant was involved in the introduction of The Regulation

Informant 4 (Interview C):

- Role in just culture Informant represents employees of the aviation sector
- Informant was involved in the introduction of The Regulation

Informant 5 (interview D):

- Role in just culture: Informant is the Legal Director of a Ministry of Transport
- Informant was involved in the introduction of The Regulation

Informant 6 (interview E):

- Role in just culture: None
- Informant was not involved in the introduction of The Regulation

Informant 7 (interview F):

- Role in just culture: Informant represents the aviation regulator of a state
- Informant was involved in the introduction of The Regulation

Informant 8 (interview F):

- Role in just culture: Informant represents the aviation regulator of a state
- Informant was involved in the introduction of The Regulation

Informant 9 (interview F)

- Role in just culture: Informant represents the aviation regulator of a state
- Informant was involved in the introduction of The Regulation

Informant 10 (interview F)

- Role in just culture: Informant represents the aviation regulator of a state
- Informant was involved in the introduction of The Regulation

Informant 11 (interview G):

- Role in just culture: Informant represents a group of employees of the aviation sector
- Informant was involved in the introduction of The Regulation

Informant 12 (interview H):

- Role in just culture: Informant is a safety manager representing the aviation industry
- Informant was involved in the introduction of The Regulation

Informant 13 (interview I):

- Role in just culture: Head of Legal service of a national aviation regulator (retired), Senior Legal Officer and acting Head of the Legal Bureau of a global aviation organisation (retired), Head of Legal Service of an ANSP (retired). Informant 13 participates actively in, European, 'just culture activities'
- Informant was involved in the introduction The Regulation

Informant 14 (interview J):

- Role in just culture: Informant is a safety manager representing the aviation industry
- Informant was involved in the introduction of The Regulation

Informant 15 (interview K):

- Role in just culture: Informant represents the Legal Director of an aviation regulator
- Informant was involved in the introduction of The Regulation

Informant 16 (interview K):

- Role in just culture: Informant represents the aviation regulator of a state
- Informant was involved in the introduction of The Regulation

Informant 17 (interview K):

- Role in just culture: Informant represents the aviation regulator of a state
- Informant was involved in the introduction of The Regulation

Appendix E - Competing discourses identified during the research:

1. 'Occurrence reporting' and 'administration of justice' are competing discourses, as just culture aims to increase occurrence reporting while providing a level of immunity against prosecution.
2. Competing discourse in time: Between the proposal by the EC (2012) and the draft of the EP (2013) versus the publication of Regulation (2014) and the evaluation of The Regulation (2021); In the proposal and the draft, the EC, EESC and the EP argue the importance of a common understanding, and definition, of gross negligence. In The Regulation, gross negligence is implicitly/indirectly defined in Article 16.10, but not in Article 2 'Definitions' (EC, 2014). A common understanding of gross negligence is not discussed in The Evaluation.
3. The system of 'no-incident/ -accident' declarations, in which organisations request such declarations and some authorities are willing to provide such declarations, create a competing discourse between the requirement to protect personal data, as described in Article 6 and Article 16 of the Regulation, versus the willingness to share personal data.
4. A bureaucratic competing discourse due to different tasks and responsibilities of different government organisations; Safety investigation versus criminal investigation.
5. EU-integration versus national sovereignty: The Regulation, which applies in the EU, is enforced by national institutions which are responsible for the administration of justice on national level. The national institutions, which execute the Member State's sovereign monopoly of power in relation to criminal law.
6. Gross negligence (A): There is a competing discourse of gross negligence on national level as organisations might have a different application of gross negligence than the boundary delimitation determined by the (national) penal code.
7. Gross negligence (B): The lack of a uniform understanding, and application, of gross negligence between Member States creates competing discourses due to different applications of gross negligence between the Member states.
8. Just culture: The Regulation distinguishes between just culture on national level and just culture on organisational level. This research learns that organisations can have a different view on just culture than the Member States. 'Just culture' on national level is a legal concept which is anchored in national criminal law. 'Just culture' on organisational level is anchored in organisational 'safety culture'.
9. A competing discourse in relation to the outcome of an occurrence; From a legal point of view, the outcome of an occurrence can be a consideration whether to prosecute persons who are involved in an occurrence (outcome driven approach). From a safety science perspective, the outcome of an occurrence depends on coincidences which are out of the control scope of the persons involved in the occurrence (event-driven approach).
10. A competing discourse in relation to the role of 'experience' in the emergence of occurrences; From a safety science perspective, the role of experience strongly depends on cognitive psychological

processes which are limited or not controlled by the frontline-operator; From a legal point of view, increased experience increases culpability.

11. Different legal systems, including different (national) views on the role of the penal code, cause different views on the purpose of the penal code
12. 'Insider' versus 'outsider' perspective of EU law: People who work withing the EU-institutions versus the people who work with EU-processes on national level
13. Perspective of (academic) authors of legal acts versus linguistic- and other specialists who implement the legal acts in the official languages of the EU, such as translators, specialists in terminology, cultural studies and communication
14. The European desire to create unity in diversity; Legal acts which are applicable in all Member States, while doing justice to the linguistic and cultural diversity of EU law
15. View on legal culture in the EU: 'View' 1 which argues that the EU has a legal culture which is rooted in the EU-treaties versus 'view 2' which argues that the EU does not have its own legal culture.
16. Basic paradox of equal authenticity: In translations between official EU-languages, source and target texts do not exist in the EU because alle EU languages are considered equal
17. Creation of European law texts versus reading and interpretation in the context of a court process in national courts
18. Competing discourse regarding the use of ambiguities in EU-law: One side the EU claims that EU-law must be unambiguous, but in the other hand ambiguities in EU-law are inevitable e.g. due to political compromises and imperfections in translations.

Appendix F – Screenshot of The Draft:

Amendment 21

Proposal for a regulation
Article 2 – paragraph 1 – point 4

Text proposed by the Commission	*Amendment*
(4) 'gross negligence' means a manifest and wilful violation of the duty of ***care*** directly causing foreseeable damage to a person or to a property, or which seriously lowers the level of aviation safety;	(4) 'gross negligence' means a manifest and wilful violation of the duty of ***professional responsibility*** directly causing foreseeable damage to a person or to a property, or which seriously lowers the level of aviation safety;

Or. fr

Justification

It would appear essential for all members of staff to be able to count on a uniform interpretation of 'gross negligence' by all competent national courts so as to enjoy the same level of protection throughout the EU. To that end, a clear interpretation of this definition is needed, specifying the nature of the duty of care referred to here.